# A DESCRIPTIVE STUDY ON INTRA AND POST OPERATIVE COMPLICATIONS OF LAPAROSCOPIC ABDOMINAL SURGERY

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# CERTIFICATE

This is to certify that this dissertation is the bonafide work of **Dr. K. YUVARAJ** on **"A DESCRIPTIVE STUDY ON INTRA AND POST OPERATIVE COMPLICATIONS OF LAPAROSCOPIC ABDOMINAL SURGERY"** during his course in M.S. General surgery from May 2007 to March 2010 at Government Kilpauk Medical College and Government Royapettah Hospital, Chennai.

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# *STUDY ON INTRA AND POST OPERATIVE COMPLICATIONS OF LAPAROSCOPIC ABDOMINAL SURGERY*

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# *INTRODUCTION*

# INTRODUCTON

Informatics, electronics and robotics are intermingled fields that constantly change the way we experience our life and practice medicine. Despite many decades of these technological developments the performance of surgical operations (the cutting and suturing of the artisan remained unchanged. The advent of minimally invasive surgery, brought about a major deviation from traditional surgery .this method has several advantages over the traditional system, but it require sophisticated instruments, training and skill. The application of laparoscopy in current surgical practice is undergoing constant changes and rapid developments. These developments have to be weighed against over-enthusiasm and the problems created by a lack of familiarity with new techniques and instruments. Without these things, we sometime land up in complications. This dissertation mainly focuses on minimally invasive surgery and its complications.

# *AIM*

# AIM

- To understand the physiological changes occurring during laparoscopic procedures.
- To analyze various laparoscopic surgeries done in our department.
- To study various complications occurring during intra and post operative periods in laparoscopic surgery.
- To evaluate the guidelines for preventing them.
- To assess the outcomes of the complications.
- To study the presentations and interventions.

# *LITERARY REVIEW*

# REVIEW OF LITERATURE

## DEFINITION

Minimal access surgery is a bondage of modern technology and surgical innovation that aims to accomplish surgical therapeutic goals with minimal somatic and psychological trauma, performing major surgery through small incision after using miniature high tech imaging system to minimize the trauma of traditional surgical methods.

Laparoscopic Surgery has revolutionized the surgical arena and brought the greatest changes in the technical practice of surgery. It has evolved as a part of general surgery and very soon found its place in the surgical practice, mostly due to its great patient demand, which the surgeons could not deny. With increasing experience it offers cost effectiveness both to health services and employees by shortening the hospital stays and allowing faster recuperation.

## MINIMAL ACCESS SURGERY

Initially laparoscopic surgery was termed a minimally invasive surgery, but this term was changed to minimal access surgery as laparoscopic surgery is an invasive procedure associated with similar risks of major complications as compared with the conventional open surgery. Minimal access surgery has crossed all traditional boundaries of specialties and disciplines, shared, borrowed and overlapped technologies and information that encourage a multidisciplinary approach that serves the patient as a whole rather than a specific organ or a system.

They can be categorized into, Laparoscopy, Thoracoscopy, Endoluminal endoscopy, Perivisceral endoscopy, Arthroscopy and intra-articular joint surgery. Among this our present concern and discussion is mainly about and around laparoscopy. Surgery of the future will be increasingly fast, increasingly safe and increasingly cheap.

# HISTORICAL BACKGROUND

While the term minimally invasive surgery is relatively recent, the history of its component parts fall over a hundred years.

MATERIALS:

- Primitive laparoscopy, by placing the cystoscopy within the inflated abdomen was first performed by KELLING in 1901.
- In 1950 HOPKINS devised a method of transmitting light through solid quartz with no heat and little light loss.
- In 1950 Geotze and Veress developed insufflation needle, which is popularly known as Veress needle.
- In late 1980 laparoscope light source and video camera were no longer separate, and assistant of the surgical team were also taking an active part of the surgical proceedings.

PROCEDURES :

- In 1910 Jacobaeus of Stockholm first used the word Laparoscopy where pneumoperitoneum was done with air
- 1942 he reported 115 laparoscopic examinations used primarily to diagnose cirrhosis, metastatic cancer or tuberculosis.
- 1972, H.Coutnay Clarke first time showed laparoscopic suturing technique for hemostasis.

- 1977, First Laparoscopic assisted appendicectomy was performed by Dekok. Appendix was exteriorized and ligated outside.
- 1977, Kurt Semm first time demonstrated endoloop suturing technique in laparoscopic surgery.
- 1987 Ger reported first laparoscopic repair of inguinal hernia using prototype stapler.
- 1987, Phillipe Mouret, has got the credit to perform the first laparoscopic cholecystectomy in Lyons, France
- 1996, First live telecast of laparoscopic surgery performed remotely via the Internet. (Robotic Telesurgery)

The development and evaluation of stereoscopic systems has been the centre of interest for research in the last few years. The first stereoscopic system was a rectoscopic system. After that research focused upon stereoscopic systems using video techniques. This latest advancement in endocamera technology involves the mounting of two micro cameras on the tip of a laparoscope. In this way a 3-D image is composed in the brain. with improved depth perception.

# PRINCIPLES OF LAPAROSCOPIC SURGERY

A rigid endoscope is introduced through a metal sleeve in the peritoneal cavity, which has been previously inflated with carbon di oxide (or) air to produce pnuemoperitoneum. Further metal sleeves or ports are inserted to enable instrument access and their use for dissection. Aided with the pneumo peritoneum and better visibility the procedure is carried out with greater ease and accuracy. With improved instruments and more experience it is proven that other advanced procedures previously regarded as controversial will also become fully accepted.

# SURGICAL TRAUMA IN OPEN AND LAPAROSCOPIC SURGERY

Most of the trauma of open surgery is inflicted because the surgeon must have wound large enough to give adequate exposure for safe dissection at the target site. The wound is often the cause of morbidity including infection, dehiscence, bleeding, herniation and nerve entrapment.

The pain of the wound prolongs recovery time and by reducing mobility contributes to an increased incidence of pulmonary collapse, chest infection and Deep vein thrombosis. Mechanical and human retraction cause further added trauma to the tissues which may end up being as painful as the wound itself. But in case of laparoscopy the retraction is provided by the low pressure pneumoperitoneum giving a diffuse force applied gently and evenly over the body wall causing minimal trauma. Exposure of any body cavity to the atmosphere also causes morbidity through cooling and fluid loss by evaporation.

The incidence of post surgical adhesions has been reduced by the use of laparoscopy because of less damage inflicted to serosal covering. The incidence of post operative ileus is reduced to a far greater extent.

# ADVANTAGES OF MINIMAL ACCESS SURGERY

- DECREASED WOUND SIZE
- REDUCTION IN WOUND :

  Infection

  Dehiscence

  Bleeding

  Herniation

  Nerve entrapment

- Decrease in wound pain
- Improve mobility
- Decreased surgical trauma
- Decreased heat loss, fluid loss
- Decreased stress response
- Visualization of the structures is improved and magnified.

## **LIMITATION OF MINIMAL ACCESS SURGERY**:

LOSS OF TACTILE FEEDBACK

DEPTH PERCEPTION:

Surgeon must operate remote from the surgical field using an imaging system that provides a two dimensional representation of the operative site. Endoscopic offers a whole new landscape which the surgeon must learn to navigate without the usual cues which makes it easy to assess depth.

HAND – EYE COORDINATION

HEMOSTASIS

UNIQUE FEATURE OF ENDOSCOIC SURGERY:

Need to lift the abdominal wall from the organs to create adequate working space.

Methods used to achieve the same are:

- Pneumoperitoneum
- Mechanical device – lap lift

**PNEUMOPRITONEUM:**

Initially to distend the peritoneal cavity air was used. The nitrogen content of the air was less soluble in blood and hence less gradually absorbed. Air pneumoperitoneum is more painful also. Subsequently carbon dioxide and nitrous oxide was used for inflating the abdomen. Nitrous oxide had the advantage of being physiologically inert and rapidly absorbed also provide better analgesia when laparoscopy is performed under local anaesthesia. No evidence of combustion has been clearly documented beyond doubt, and its safety within the peritoneal cavity has been established beyond doubt. It reduced the Intraoperative end tidal $CO_2$ and minute ventilation.

Safety in pregnancy is still under definite control study.

$CO_2$ PNEUMOPERITONEUM:

$CO_2$ - most commonly used.

Physiological effects can b divide into:

GAS SPECIFIC EFFECTS:

$CO_2$ rapidly absorbed across peritoneal membrane.

$$CO_2 + H_2O \text{ -- } H2CO3 \text{ -- } H^+ + HCO_3^-$$

Respiratory acidosis by the generated carbonic acid. Body buffers aid in the absorption of CO2 and minimize the development of hypercarbia or respiratory acidosis during brief endoscopic procedures. Once the body buffers are saturated respiratory acidosis develop rapidly. Hypercarbia leads to respiratory acidosis resulting in cardiac arrhythmias, increased vascular resistance, high blood pressure, increased cardiac work load, Increased myocardial $O_2$ demand and eventually Increased chance of Myocardial infarction

PRESSURE SPECIFIC EFFECTS ON:

- MAJOR BLOOD VESSEL
- RESPIRATORY SYSTEM
- CARDIOVASCULAR SYSTEM
- RENAL SYSTEM
- EFFECT ON COAGULATION

# PHYSIOLOGY

Although laparoscopy causes fewer untoward effects than open surgery, physiological functions are altered during performance of any surgical procedure. Insufflations of gas into the peritoneum, preperitoneal space or retroperitoneal space increases intra abdominal pressure thereby

Impairing ventilation

Decreases venous return

Depressing circulation

Reducing renal perfusion

Increasing intra cranial pressure

This process although less marked, is analogous to abdominal compartment syndrome. The type of gas used for insufflations is equally important. Obesity magnifies the effect of pneumoperitoneum and complicates patient positioning. The patient physical size and weight place stress on pressure points, increase the difficulty of securing the patient to the table and increase intra abdominal pressure. Patient position is important especially.

Adequate visualization of pelvic and lower abdominal structures requires steep trendelenberg while those in the upper abdomen requires modified lithotomy or split led position and reverse trendelenberg position.

All of these positions place particular stress on pressure points necessitating careful padding. Excessive local pressure and shifting of the Centre of gravity increase the risk of development of pressure sores and nerve compression syndromes post operatively. Although intraoperaive management of patient undergoing laparoscopic surgery can be challenging, benefits are derived postoperatively.

**PULMONARY EFFECTS :**

Peritoneal insufflations causes increased intraabdominal pressure and volume, resulting in decreased diaphragmatic excussion with decreased vital capacity, pulmonary compliance. Basal lung segments are compressed, due to which there is decreased functional residual capacity, increasing alveolar dead space and eventually altered ventilation perfusion ratio.

Absorption from the peritoneal cavity increases the delivery of $CO_2$ to the lung as much as 50%. Closer monitoring off end tidal $CO_2$ and arterial blood gases is essential for at risk patient during laparoscopy. Since elevated $PCO_2$ Continues for approximately 30 minutes after the release of pneumoperitoneum monitoring must extend well into the postoperative

period. Alternate gases like argon, helium, neon are suggested for creating pneumoperitoneum. These gases are appealing because they being inert, cause no metabolic effects but are poorly soluble in blood and hence can lead on to gas emboli, if the gas has access to the venous system. It also induce loco regional acidosis, in the absence of systemic acidosis, impairing micro circulation and decreasing organ blood flow, Increasing intra abdominal pressure, decrease blood flow to stomach, jejunum, colon, liver. Pulmonary function test including FVC, $FEV_1$, show smaller decrements postoperatively when compared to open surgery. More important are the benefits of lower incidence of atelectasis and improved oxygenation.

**CARDIOVASCULAR EFFECTS:**

CVS effects of laparoscopy are well tolerated in healthy individuals but pose a threat to patients with co morbid conditions that impair compensatory mechanism. Careful monitoring is mandatory with optimization of patient's fluid balance. Open surgery to be considered in patients with severely impaired cardiac function.

The consequences of laparoscopy on CVS are due to

Increased intra abdominal pressure

Patient position.

**PNEUMOPERITONEUM** produce

Increased CVP, CWP – preload

Increased mean arterial pressure

Increased systemic vascular resistance-after load

These changes have a dual effect

Increased preload tends to augment cardiac output

Increased after load decrease cardiac output

**EFFECT ON BLOOD VESSELS:**

IVC and iliac veins are compressed reducing the flow from lower limbs to the heart. Increased pressure over the splanchnic circulation increase flow towards heart. Increased pressure over the aorta increases after load, increase cardiac workload and cardiac strain. Increased pressure over git and mesenteric vessels decrease the visceral blood flow.

The cardiovascular changes depends on the patient's volume status, autonomic response and cardiac reserve. Physiological changes associated with patient positioning and repositioning is equally important. Trendelenberg position increases intrathoracic pressure, CVP, CWP, mean arterial pressure and increasing cardiac work. Reverse trendelenberg position leads to reduction in cardiac output by decreasing preload and may cause hypotension.

Hypercarbia due to $CO_2$ absorption causes arteriolar dilatation and myocardial depression which tends to lower blood pressure. These results are countered by autonomic response, mostly due to sympathetic system that elevates heart rate, systolic blood pressure, CVP, left ventricular stroke volume and cardiac output. Also indirect effect on renin angiotensin and vasopressin leads to decreased urine output.

Patients with cardiac disease are at increased risk for complications as the chance of MI is increased during and post laparoscopic procedure.

## RENAL EFFECT

Increased intraabdominal pressure results in decreased cardiac output and decreased blood flow to the kidney. Directly resulting in decreased urine output (intraoperative oliguria) which activates rennin angiotensin. The effects depend on the volume status of the patient.

The effects on both renal blood flow and urine output can be controlled by optimizing the volume status of the patient.

## EFFECTS ON THE COAGULATION SYSTEM

Tissue trauma activates the coagulation and fibrinolytic system. So increased risk of venous thrombosis and pulmonary embolism. Hyper coagulation is linked to VIRCHOW'S triad:

- Endothelial injury
- Stasis
- Increased viscosity

Although the tissue trauma is thought to be less with minimally invasive procedures, increasing intra abdominal pressure with

pneumoperitoneum and patient positioning decrease venous return from the lower limb.

Increased intraabdominal pressure with decreased venous return from lower limb causes increased stasis and increased risk of thrombosis. But in practice it is not so because relatively shorter duration of the procedures and early ambulation of the patient following the procedure.

D-dimers increase more significantly in open surgery than laparoscopic surgery. Antithrombin III and protein C (both decrease coagulation) decrease in both groups.

Findings suggest less activation of the coagulation system with laparoscopic patient. Although the risk appears less, patients may still develop venous thrombosis and pulmonary embolus mainly high risk patient like obese persons, long duration laparoscopic surgical procedures.

Therefore deep venous thrombosis prophylaxis is indicated during laparoscopic procedures.

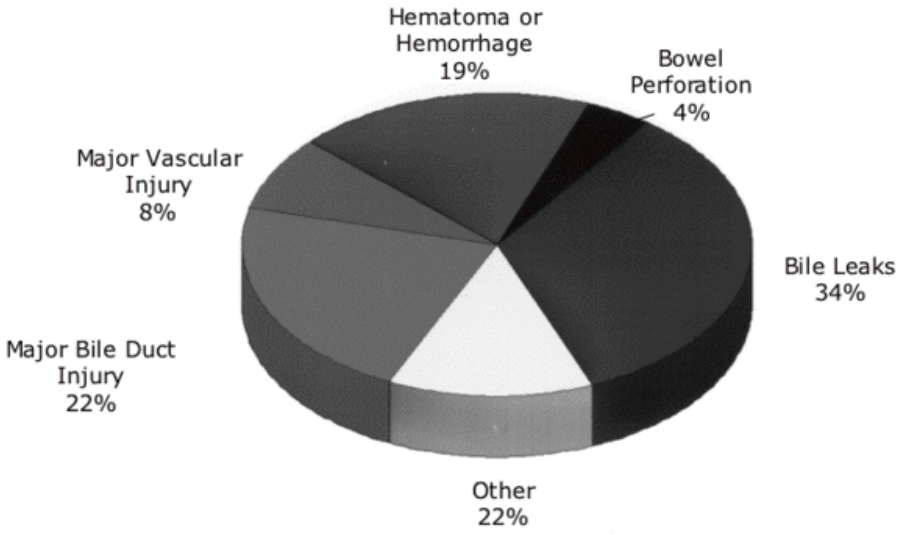
# COMPLICATIONS

No intervention procedure is without its inherent risk. Complications occur. In order to obtain acceptable results training programme must include supervision at all levels of development and there must be a high degree of awareness of the potential risks laparoscopic surgery.

The incidence of laparoscopic complications as by literature:

- **1.1% to 5.2%** in minor procedures
- **2.5% to 6%** in major ones (**Kane & Krejs, 1984**).

# COMPLICATIONS



## COMPLICATIONS MAY BE ASSOCIATED WITH:

- Failure to complete the procedure
- Anaesthetic complication
- Induction of pneumoperitoneum
- Insertion of trocar and cannula
- Thermal instruments and injuries
- Mechanical instruments and injuries
- Position and duration of surgery related complications
- Other associated complications

## FAILURE TO COMPLETE THE PROCEDURE

Failure to complete the procedure is not generally associated with morbidity, however if the laparoscopy is not completed safely, the patient may have to undergo laparotomy with it is attendant potential for complications. There may be failure due to inability to establish pneumoperitoneum or complex disease process. However the major cause of failure is the experience of the surgeon or poor technique. Hence the need for proper training and supervision must be repeatedly stressed.

## ANAESTHETIC COMPLICATION

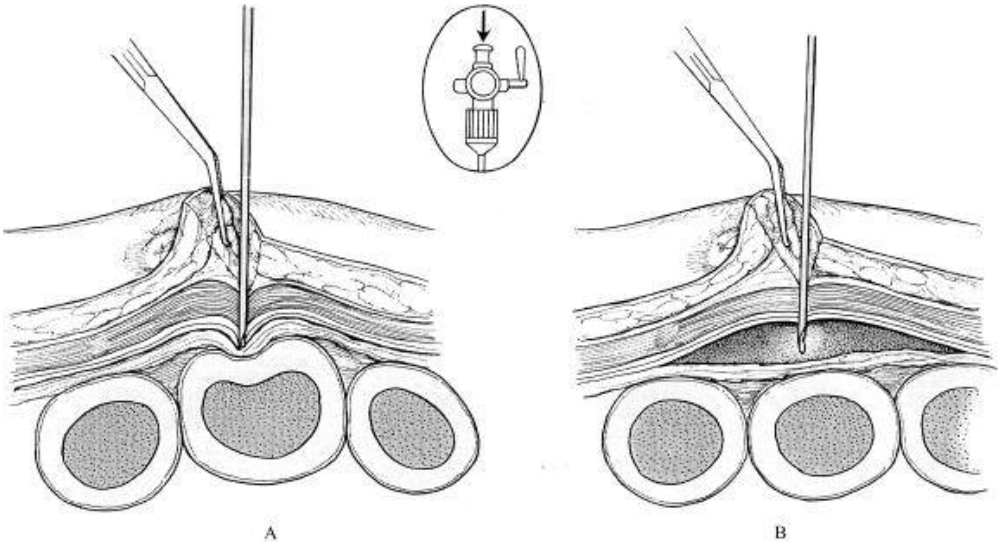
Complications directly attributable to the general anesthesia are no different from those which may occur when any type of surgery is performed. The use of a steep trendelenberg position and distension of the abdomen may both reduce the excursion of the diaphragm.

$CO_2$ can be absorbed, particularly during prolonged operations. This combination of reduced depth of respiration and hypercarbia puts the patient who is undergoing laparoscopy at increased risk of developing cardiac arrhythmias. Monitoring by pulse oximetry, the use of ETT intubation and positive pressure assisted ventilation reduces these risks to a minimum.

If arrhythmia occurs the anaesthetist will be responsible for its management but at liberty to instruct the surgeon to return patient to supine position, evacuate the pnuemoperitoneum and discontinue the surgery.

Vasovagal reflex may produce shock and collapse, especially if the anaesthetic is not deep enough. It may be prevented by efficient anaesthesia and should only be diagnosed when other causes of shock have beenexcluded.

# CREATION OF PNEUMOPERITONEUM



## PNEUMOPERITONEUM – VERESS NEEDLE INJURIES

### EXTRA PERITONEAL GAS INSUFFLATIONS

Failure to introduce the needle into the peritoneal cavity may produce extra peritoneal emphysema. This occurs in about 2% of cases. Palpation of the abdomen may reveal the presence of crepitus. If this is recognized early the carbon di oxide may be allowed to escape and the needle reintroduced through the same or another site.

If the complication is not recognized during introduction of the gas, the typical appearance of extra peritoneal gas may be recognized when an attempt is made to telescope. It is always essential to view through the telescope during its insertion through the cannula. The typical spider web appearance caused by pre peritoneal insufflations will be seen and further stripping of the peritoneum by the tip of the telescope avoided. In this situation the laparoscope should be withdrawn and attempts made to express the gas, the needle may then be reintroduced.

### MEDIASTINAL EMPHYSEMA

Gas may extend from the correctly introduced pneumoperitoneum into the mediastinum and create mediastinal emphysema. Extensive

emphysema may cause cardiac embarrassment which will be diagnosed by the anaesthetist. There will be loss of dullness to percussion over the

**COMPLICATION RATES WITH VERESS INSERTION INJURY**

| INSERTION ATTEMPTS | FREQUENCY | COMPLICATION RATES |
|---|---|---|
| First | 85.5-86.9% | 0.8-16.3% |
| Second | 8.5-11.6% | 16.31-37.5% |
| Third | 2.6-3.0% | 44.4-64% |
| More than 3 | 0.3-1.6% | 84.6-100%. |

precardium. The laparoscope must be abandoned ad as much gas as possible must be evacuated. Patient to be kept under close observation. Occurs in about 2% of cases.

PNEUMOTHORAX

May result from insertion of the veress needle into the pleural cavity. Whenever a high site of insertion is chosen, the needle should be directed away from the diaphragm and as always the standard protocol of aspiration and sounding test employed.

Pneumothorax should be suspected if there is difficulty in ventilating the patient. There may be a contra lateral mediastinal shift and increased tympanism over the affected area. The procedure should be abandoned and gas allowed to escape. Patient to be observed.

PNEUMO-OMENTUM

The omentum will be penetrated by the veress needle in about 2% of the cases. The misplacement should be recognized by the aspiration test and position of the tip altered to free the needle. There will also be a raise in the insufflations pressure, which should lead the surgeon to suspect an error in the position of the needle.

## PENETRATION OF A HOLLOW VISCUS

Veress needle may enter the bladder stomach or bowel. Routine cathetrisation of the bladder and proper sitting of the needle will prevent bladder penetration. If pneumaturia is noted the needle should be partially withdrawn and creation of pneumoperitoneum continued. The bladder peritoneum should be carefully inspected to ensure that no significant damage has been caused. The treatment of simple puncture is conservative.

Penetration of stomach may occur when an upper abdominal site of insertion is chosen or if the stomach is distended during induction of anaesthesia. Gastric distension may also occur if anaesthesia is maintained with a mask and should be suspected if there is upper abdominal distension and increased tympanism. In the case the stomach should be aspirated with nasogastric tube.

The aspiration test permits early recognition of perforation of the GIT Bowel penetration should be suspected f there is asymmetric abdominal distension, belching, passing of flatus, faecal odour. In such a case the induction of pneumoperitoneum should be stopped and the needle resited to introduce pneumoperitoneum correctly. A simple needle penetration requires no treatment but the patient should be kept under observation.

## BLOOD VESSEL INJURY

The veress needle may penetrate mesenteric or omental vessels or any of the major abdominal or pelvic vessels. Damage to the major vessels may be prevented by lifting the abdominal wall, and angling the needle towards the pelvis once the initial thrust through the fascia has been made and by inserting only as much of needle as necessary. Thin patient and children are at particular risk o this injury. It is impossible to ensure that the omentum is not in contact with the abdominal wall.

The aspiration test should indicate that the tip of the needle is in a blood vessel when blood is withdrawn. If this occurs the needle should be withdrawn, repositioned and pneumoperitoneum introduced. A careful examination is made to determine the site and extent of the injury.

Minor injury may be treated conservatively and reexamined at the end of the procedure. Bleeding from the major vessel or formation of a large hematoma necessitates immediate laparotomy with the aid of a vascular surgeon at disposal.

## GAS EMBOLISM

Intravascular insufflations of gas may lead to gas embolism or even death. This can only happen if the penetration by the veress needle goes unrecognized and the insufflations commences. It should be prevented by routine use of the aspiration test.

Dramatic collapse may result from penetration of a major vessel but the bleeding may not be immediately evident if it is retroperitoneal. Collapse may also be caused by gas embolism. A thorough search must be made for evidence of the extent of vessel damage. This includes retraction of the bowel to expose the aorta above the pelvic brim where the most common perforation lies. Failure to do so may result in continued bleeding and formation of large hematoma leading to a second episode of shock few hours later.

## PUNCTURE OF LIVER AND SPLEEN

When a high insertion site is chosen

Presence of hepatomegaly or spleenomegaly.

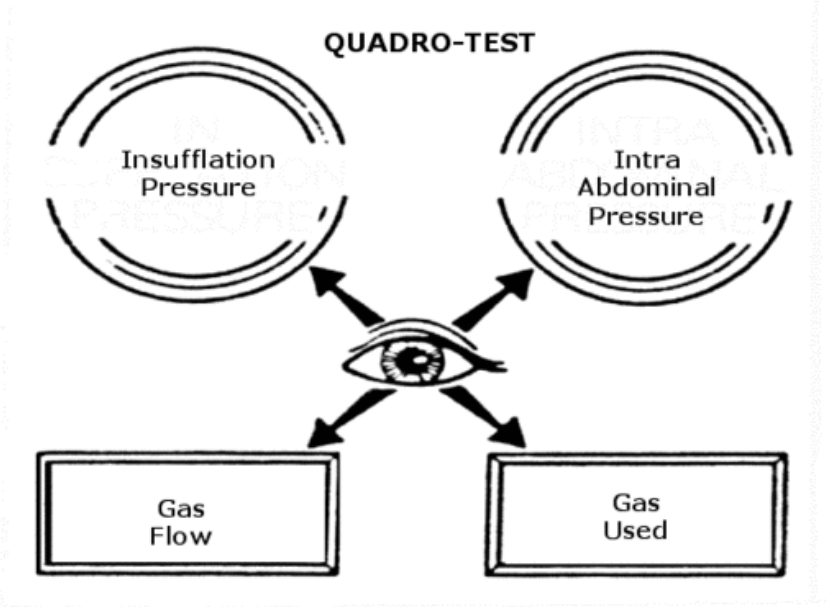
The aspiration test and the high insufflations pressure will make it obvious that the needle is sited incorrectly, in which case it should be withdrawn and resited.

## COMLPLICATIONS FROM THE DISTENSION MEDIUM

$Co_2$ accepted as distension medium for all operative laparoscopies. Gas embolism is possible but uncommon because the gas is highly soluble, which allows resorption so quickly that even if there has been a moderate embolism, the circulatory changes return to normal within a few minutes and the patient recovers. Cardiac arrhythmias may due to excessive absorption of $CO_2$. Post operative pain is common with $CO_2$ insufflation due to peritoneal irritation which is a result of production of carbonic acid. This chest pain may be confused with coronary heart disease and may be treated inappropriately with anti-coagulation.Theoretical chance of combustion when the usage of $N_2O$ as a distension medium is unlike with high frequency bipolar current.

The only place for $N_2O$ is where laparoscopy is being performed under local anaesthesia, and the pain factor become important. This is really only applicable to tubal sterilization with clips or rings and not to more advanced laparoscopic techniques.

QUADRO TEST


QUADRO-TEST
Insufflation Pressure
Intra Abdominal Pressure
Gas Flow
Gas Used

## INSERTION OF TROCARS AND CANNULAE

It produces some of the most serious injuries.More common with sharp tipped trocars than blunt tipped trocars.

Insertion of the primary trocar and cannulae is a blind procedure more or less. The site of the secondary ports of entry must be selected carefully and the insertion must always be made under visual control. It is possible to produce complication during insertion even when the standard protocols have been meticulously observed.

INJURY TO VESSELS IN THE ABDOMINAL WALL

Superficial bleeding from the incision rarely give concern and always stops on application of pressure. Bleeding from puncture of deep inferior epigastric artery is more serious.

The artery is at risk during insertion of secondary trocars and cannulae. This may be prevented by inserting them through the safety triangle, transilluminating the abdominal wall before insertion or by visualizing the artery as it runs lateral to the obliterated umbilical artery. A small leak from a major vessel may not be immediately apparent. The intra-abdominal pressure of the pneumoperitoneum and the decrease venous pressure induced by the Trendelenberg position may temporarily control it.

However, as soon as the intra-abdominal and venous pressures return to normal, the bleeding may recommence and produce a retro-peritoneal haematoma and shock. It is essential therefore, at the completion of any laparoscopic procedure, but especially those involving the pelvic side wall, to inspect the course of the major vessels and look for a haematoma.

DIAGNOSED BY:

The blood dripping into the pelvis from the trocar wound, or Spurting across the abdominal cavity. Immediate or delayed appearance of large abdominal wall hematomas indicates damage to the deep inferior epigastric artery.

TREATMENT:

Insert the Foley's catheter with the bulb at the level of the bleeding point. It is now inflated giving mechanical compression to the bleeding point. The incision should be enlarged so as to expose the anterior rectus sheath. A round bodied needle should be inserted through the full thickness of the abdominal wall from the sheath to the peritoneum under laparoscopic control. The needle point should be brought out again to the surface of the rectus sheath and knot tied firmly on the sheath. This is preferable to tying the knot on the skin which is painful and leaves an unsightly scar although it is acceptable to tie the knot over a gauze swab to prevent skin injury. It may be

necessary to insert two sutures, one above and one below the site of bleeding. Occasionally it may be necessary to open the wound wider to localize the bleeding artery.

INJURY TO AN INTRAABDOMINAL VESSEL

Injury to minor blood vessels is usually self limiting or controlled by bipolar electro coagulation.

Damage to major vessels is more serious than with a veress needle because of the size of the trocar tip may result in profuse bleeding. Injury to the omental vessels may compromise the vitality of a segment of the bowel. Managed by resuscitation, laparotomy, vascular repair or ligation. A small leak from the inferior vena cava may not be immediately apparent. The intra abdominal pressures of the pneumoperitoneum and the decreased venous pressure induced by trendelenberg position may temporarily control it however as soon as the intra abdominal and venous pressures return to normal, the bleeding may recommence and produce a retroperitoneal hematoma and shock.

**INJURY TO THE HOLLOW VISCUS**

May vary from superficial damage to the mucosa to complete penetration into the lumen. If penetration has occurred, the viscus may slip

off the trocar, the trocar may remain within the lumen or rarely the trocar may pass right through a loop of bowel which becomes impaled upon it.

It is always important to inspect the bowel at the axis of insertion of the primary trocar and cannula to ensure that it has not been damaged. If the cannula remains within the bowel, the injury will be obvious by the recognition of mucosal folds. A thorough and thorough injury may be missed and become apparent by the sight of faecal soiling, a faecal smell when the pneumoperitoneum is released or the subsequent development of peritonitis. Minor injuries will be self limiting. They should be inspected at the completion of the procedure. Peritoneal wash to be given.

**INJURY TO THE STOMACH AND BOWEL MANAGED BY**

- Classical laparotomy – perforation closure
- Laparoscopic repair of the perforation

Uterus – small laceration may be treated with bipolar electro coagulation if bleeding does not stop spontaneously.

Bladder laceration may be sutured in two layers using a lap intracorporeal suturing technique and a foley catheter should be inserted into the bladder.

## THERMAL INJURIES

Burns from electric current were one of the major causes of complications.The incidence of burns was dramatically reduced by the introduction of bipolar and thermal coagulation and mechanical devices to occlude the cautery tubing However the upsurge of operative laparoscopy by a generation of surgeons who have not been exposed to these complications before, has led to an increase in the incidence of electrical burns.

Monopolar electric current passes into the patient's body from the electrode, which may be forceps or a needle, the current passes into the patient tissues at the point of contact and then must return to the generator through the return plate. This is usually placed on the patient's leg. The effect of the electric current will depend on its power and power density, on the area of application, duration of application. To obtain maximum tissue effect the area of application at the target organ is small. The current passes from that small area along the path of least resistance towards the return plate. The area of return plate is large. So the power density at the site of application to the skin is low.

Occasionally the monitoring system may not be properly earthed. If the current passes through an ecg electrode instead of the return plate, the patient may suffer a skin burn because the ECG electrode is small and so the power density is high at this site.

Bipolar electrocoagulation removes most of the dangers of distant electrical burns.

The bowel is the most commonly injured organ. The injury may range from minor blanching of the servos to frank perforation which requires laparotomy excision of the surrounding devitalized bowel and repair of the defect. If the blanching is significant laparotomy and over sewing of the area must be done immediately.

Failure to do so may result in delayed ischemic necrosis at the site of the burn. Nothing may happen for up to 48 hrs by which time the patient has gone home. The insidious development of vague abdominal symptoms, discomfort, anorexia, and possibly pyrexia occur. Faecal fistula and faecal peritonitis occur slowly. So the patient become seriously ill over a period of days before readmission is requested. Laparotomy is followed by repair of the bowel or more often colostomy and drainage of the peritoneum is required.

**MECHANICAL INSTRUMENTS**

The main injuries caused by scissors or forceps are to blood vessels.

## OTHER COMPLICATIONS ASSOCIATED WITH LAPAROSCOPY

### SHOULDER PAIN

The $CO_2$ is converted to carbonic acid when it is in solution with body fluids. This is irritant to the peritoneum. Diaphragmatic peritoneal irritation produce pain which is referred to the shoulder by the phrenic nerve. This pain may be confused with cardiac pain by the unwary physician and treated inappropriately.

### OMENTAL HERNIATION AND RICHTER'S HERNIA

If the primary cannula is withdrawn with its valve closed, it is possible to draw a piece of omentum into the umbilical wound by the negative pressure so produced. This is usually recognized immediately and the omentum is replaced. Herniation may occur some hours after operation. It is usually easy to replace it under local anaesthesia and restore the wound. Incisions greater than 7 mm should be sutured in layers to prevent formation of a Richter's hernia.

## EXPLOSION

Intra peritoneal explosion is very rare but dramatic complication. If the bowel is inadvertently punctured, methane gas is released. If nitrous oxide has been used to create pneumoperitoneum, then methane and nitrous oxide mixture formed is potentially explosive. High frequency electric current may ignite the gas and cause an intraperitoneal explosion.

## LAPAROSCOPIC COMPLICATIONS

| S.NO | CLINICAL STUDY | COMPLICATIONS |
|---|---|---|
| 1 | Australian Endoscopy Society | 0.11% |
| 2 | Journal of Laparoendoscopic & Advanced Surgical Techniques | 0.41% |
| 3 | Lap Group Roma, Gruppo Laparoscopico Romano | 0.05% |
| 4 | Netherlands multicentric prospective study | 0.57% |
| 5 | The West of Scotland Laparoscopic Cholecystectomy Audit Group | 0·3 % |
| 6 | The Royal College of Obstetricians and gynaecologists –London, | 0-3% |

# GENERAL COMPLCATIONS OF LAPAROSCOPY

INJURY TO ADJACENT ORGANS

BLEEDING FROM SOLID ORGANS - LIVER AND SPLEEN VASCULAR INJURIES

PUNCTURE/PENETRATION/CAUTERIZATION OF THE BOWEL

TRANSACTION/PERFORATION OF BILE DUCTS

PERFORATION OF THE BLADDER

PUNCTURE/PERFORATION OF THE UTERUS

COMPLICATIONS OF THE ABDOMINAL ACCESS

PORT SITE HERNIA

WOUND INFECTION

COMPLICATION OF SPECIMEN REMOVAL

PORT SITE RECURRENCE OF CANCER

SPLEENOSIS

ENDOMETRIOSIS

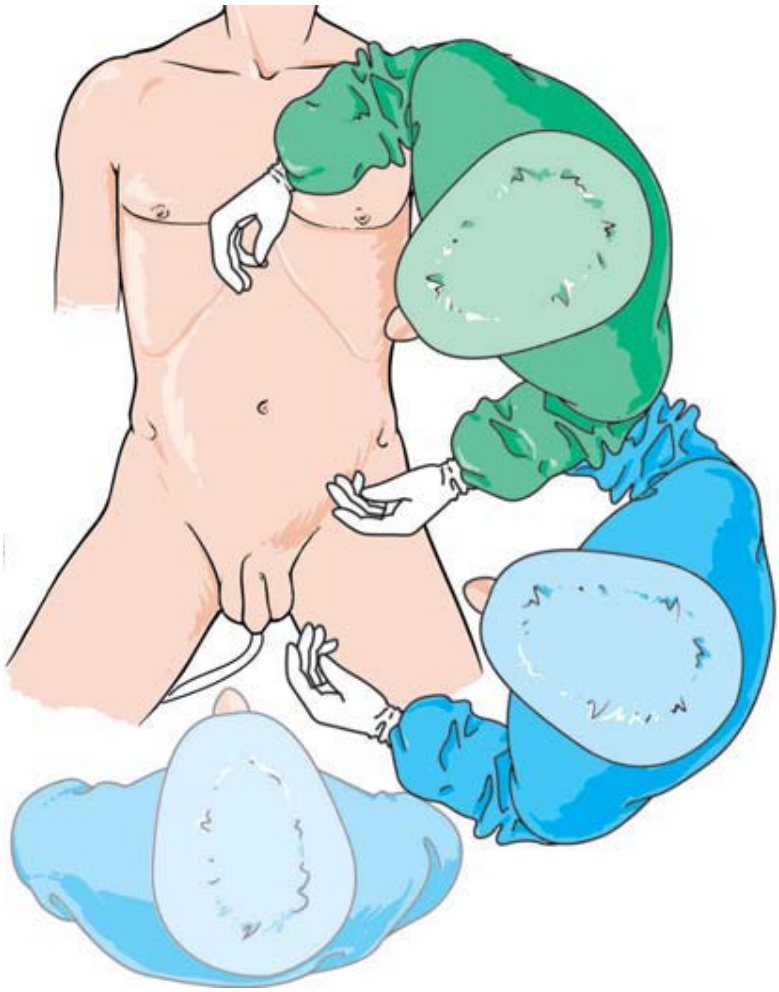
COMPLICATIONS OF PNEMUOPERITONEUM

PNEUMOTHORAX/PNEUMOMEDIASTINUM

GAS EMBOLISM

SUBCUTANEOUS EMPHYSEMA

# PROCEDURES



## SPECIFIC PROCEDURES

- Diagnostic laparoscopy
- Laparoscopic appendicectomy
- Laparoscopic cholecystectomy
- Laparoscopic hernia repair

## DIAGNOSTIC LAPAROSCOPY

Despite sophisticated methodology to image abdominal contents, establishment of a diagnosis prior to surgery remains difficult for several conditions. Unnecessary laparotomy is painful, increases hospital stay, increases cost relatively and increases morbidity.

Diagnostic laparoscopy effectively establishes a diagnosis, can be therapeutic, and causes less morbidity. Diagnostic laparoscopy identifies the problem with close to 95% specificity.

## INDICATIONS

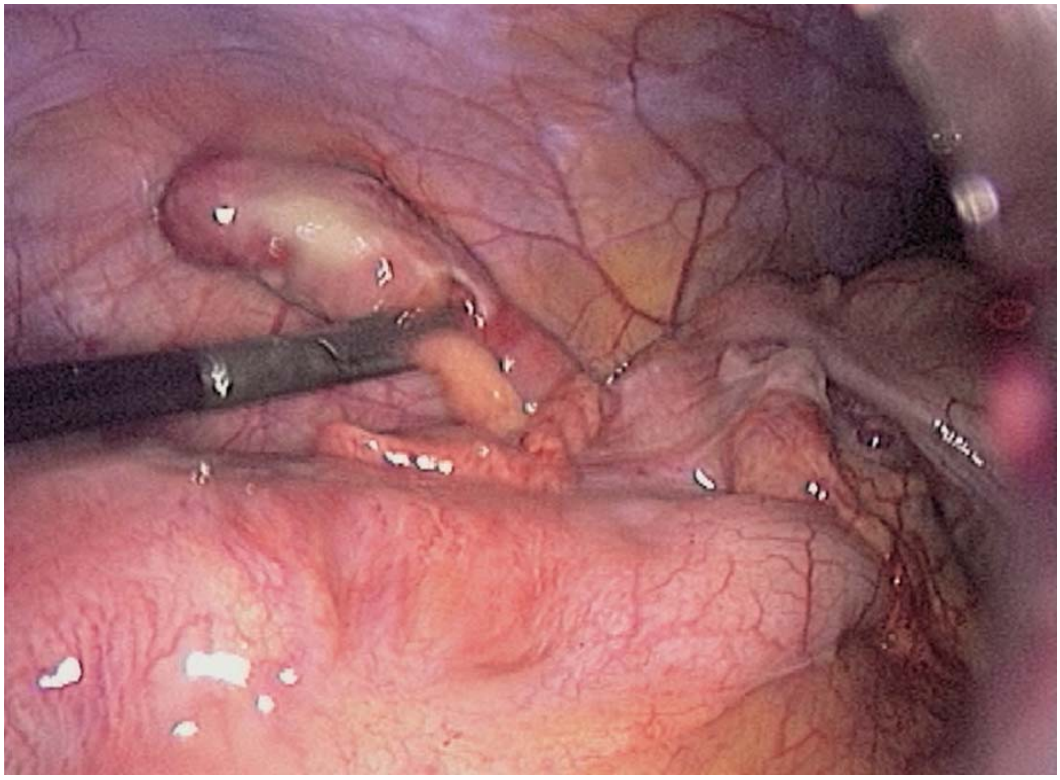
Acute abdomen,

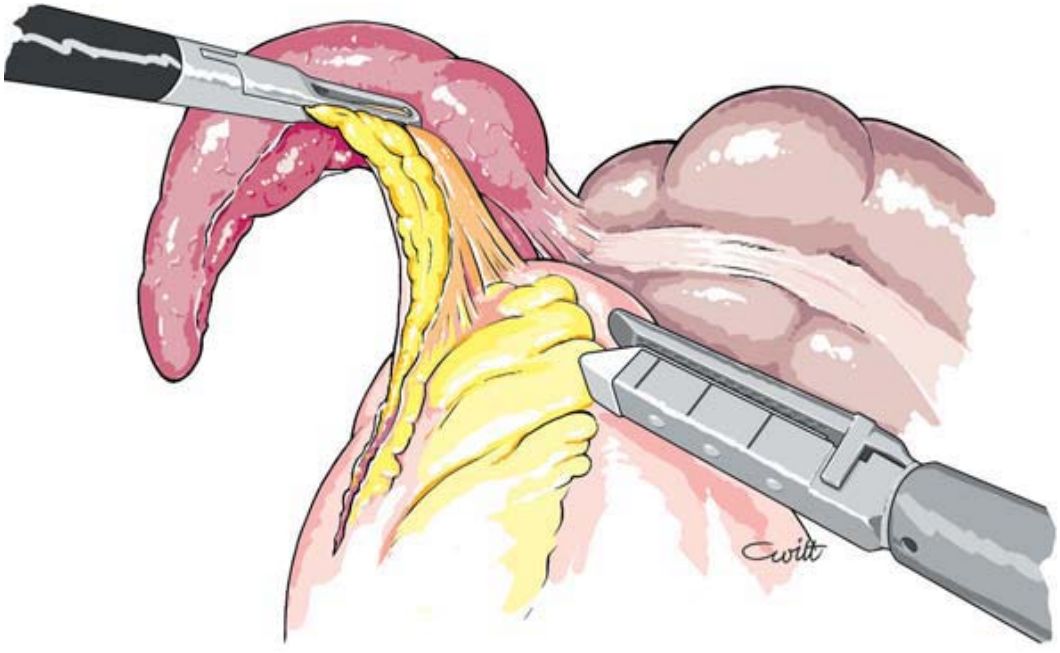
Chronic abdominal/pelvic pain

Tumour staging

Evaluation of an abdominal mass are the major surgical indications.

# APPENDICECTOMY





## SURGICAL METHOD OF
## LAPAROSCOPIC APENDICECTOMY

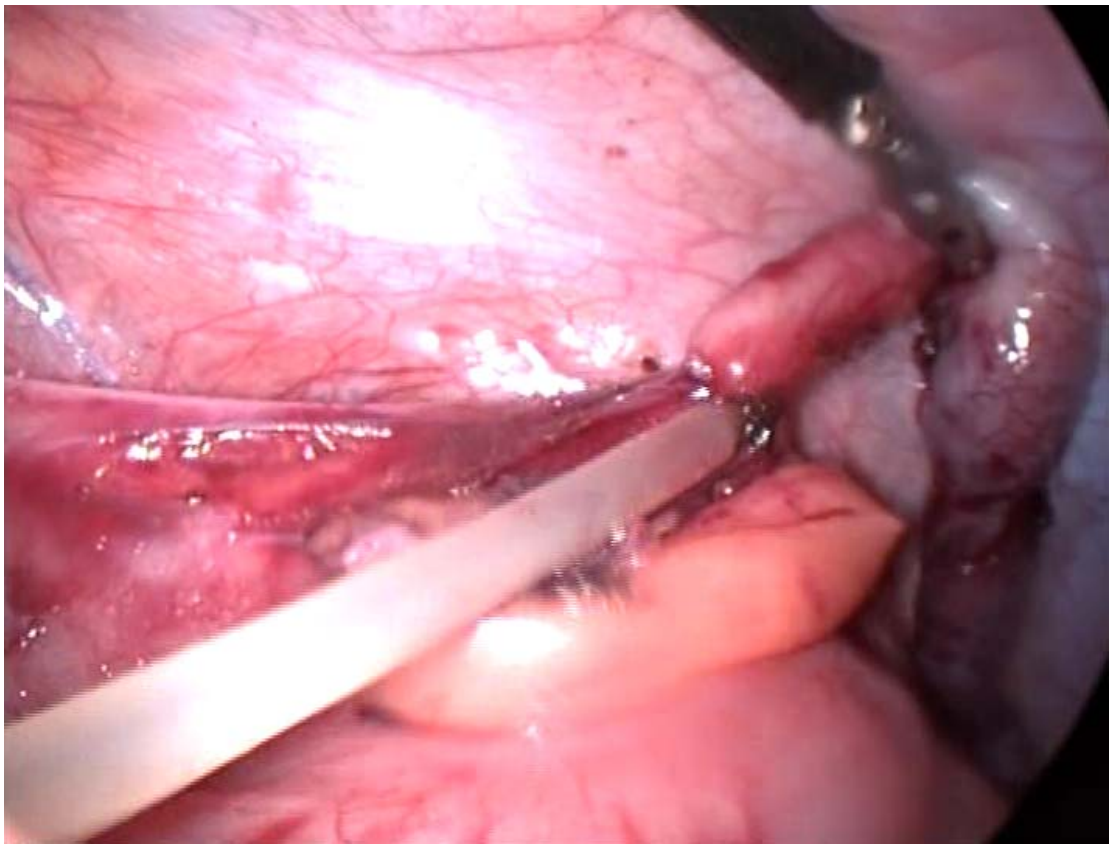
Under ET general anaesthesia patient in supine position with moderate trendelenberg left tilt, with the surgeon positioned to left of the patient. Port created for 10mm-subumbilical Camera/telescopic port and secondary ports as 5mm Right lumbar and 5/10 mm Left iliac region.

| | | |
|---|---|---|
| Insufflator | : | Flow rate - 6 l/min |
| Intraabdominal pressure | : | 12 mm Hg |
| Diathermy | : | Bipolar |

Pneumoperitoneum with veress needle and $CO_2$ and other working ports created. With detailed examination and confirmation of the diagnosis, identify the appendix, display the mesoappendix.

Coagulation or clipping the vessels is done thereby skeletonizing the appendix. Ligature of appendicular base, followed by appendicectomy and delivery of the specimen through one of the access ports is done. Hemostasis checked before exit.

# ENDOLOOPING



## SURGICAL METHOD OF

## LAPAROSCOPIC CHOLECYSTECTOMY

Under ET general anaesthesia patient in supine position with reverse Trendelenberg position, with the surgeon positioned to left of the patient. Ports created in subumbilical for 10mm-Camera/telescopic port, 5mm midepigastric & midclavicular line ports, and 10 mm sub costal rt. Ant.Axillary line .

Insufflator : Flow rate - 6 l/min

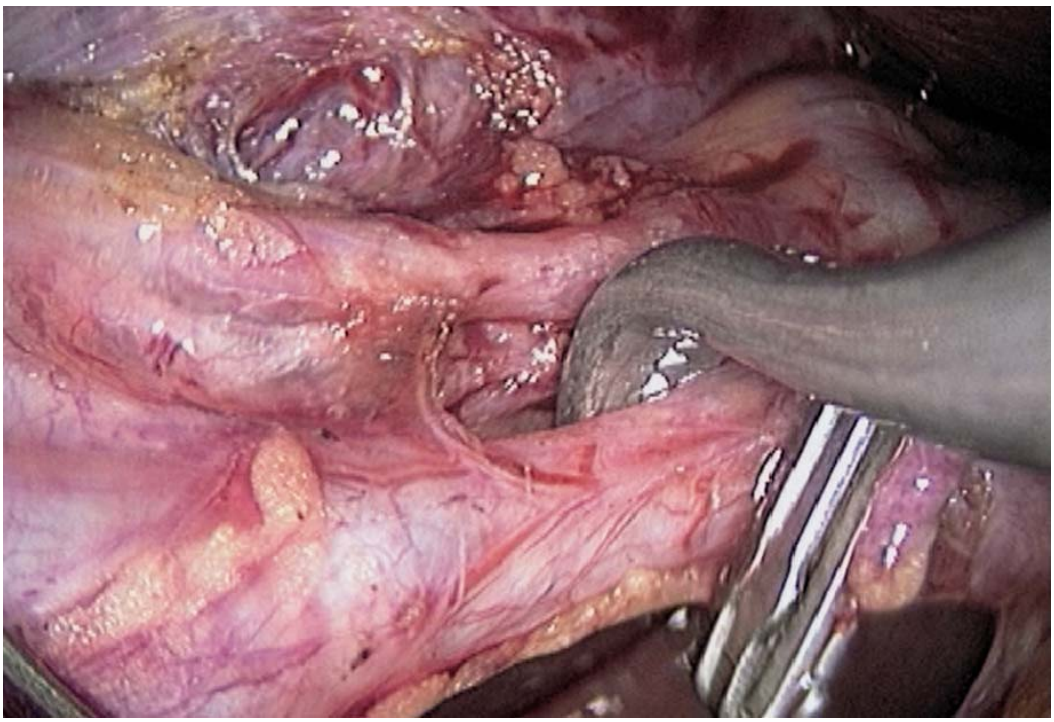
Intraabdominal pressure : 12 mm Hg

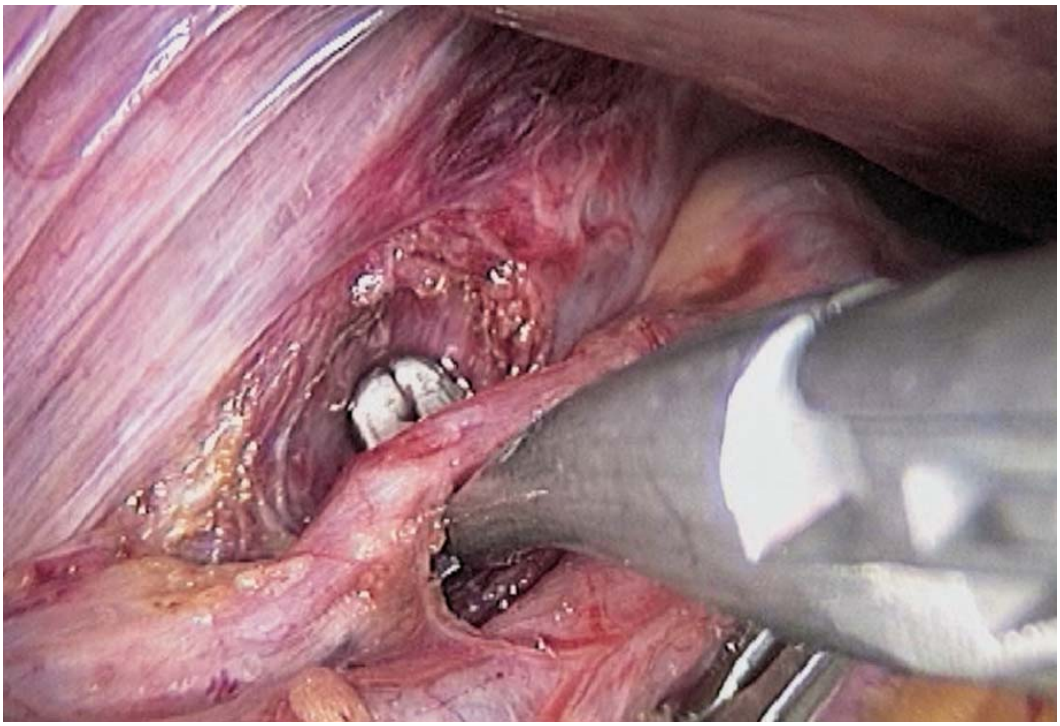
Procedure

Pneumoperitoneum created with veress needle and $CO_2$. Ensure maximum cephalic traction and maintain lateral and inferior traction on Hartmann's pouch. This maneuver avoids alignment of the cystic and common bile duct allowing more precise identification of both structures.

Dissection should begin high in the neck of the gall bladder and proceed in a lateral to medial direction. Hartmann's pouch should be turned medially for poster lateral dissection of GB. Dissect the neck of the gall bladder from its hepatic bed. Clear view of cystic duct should be obtained before application of the clips.

Intraoperative cholangiography  -not routinely done





Division of cystic artery and cystic duct is done. Dissection should continue close to the gall bladder wall and away from the liver hilum. retrograde cholecystectomy is the further step. The gallbladder is retrieved, either directly or with a protective bag, depending on the degree of inflammation. Closure after letting out of pneumoperitoeum.

Fundus-first laparoscopic cholecystectomy:

Removal of the gallbladder with commencement of dissection at the fundus is well recognized as a safe technique during difficult cholecystectomy because it minimizes the risks of damage to the structures in or around Calot's triangle

**COMMON COMPLICATIONS ENCOUNTERED**

1. Due to extensive adhesions the procedure being converted to open.
2. Bleeding from the liver, gall bladder bed/fossa.
3. Injury to CBD -Diathermy injury or clipping of CBD.
4. Difficulty in delivering the specimen.

The most important complication related to the operative procedure of laparoscopic cholecystectomy is biliary injury. Major bile duct injury during laparoscopic cholecystectomy is associated with local factors (e.g. acute cholecystitis, gallstone pancreatitis, and aberrant anatomy) and experience of

surgeon. The classic mechanism for major bile duct injury involves misidentification of the common bile duct or common hepatic duct for the cystic duct. This leads to dissection of the common hepatic or common bile duct, with the associated possibility of devascularization, and results in loss of part of the biliary tree. A second common method of injury is delayed stricture related to thermal injury. The first attempt at a repair for a major biliary injury offers the best chance for the patient. Repair of a major bile duct injury should be undertaken by an experienced hepatobiliary surgeon, even if this involves transfer to another facility for definitive care.

## GUIDELINES FOR PREVENTING BILE DUCT INJURY DURING CHOLECYSTECTOMY

Recognize at risk situations

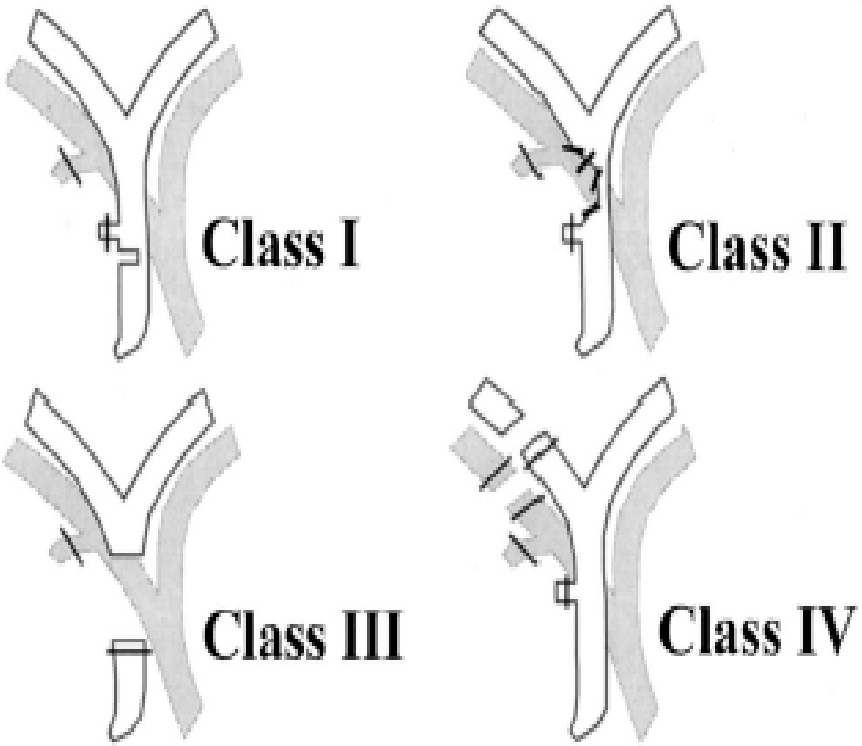
Severe cholecystitis, Fibrotic, shrunken gallbladder, Absent or short cystic duct, Cystic duct arising from the hepatic duct, Aberrant or accessory hepatic duct, Aberrant right hepatic artery

Retract gall bladder fundus superiorly and infundibulum to the right and inferior to open the Calots triangle. Dissect lateral to medial. Meticulously dissect the cystic duct and artery close to the gall bladder.. Do not clip, divide or cauterize structures unless clearly identified Perform intraoperative cholangiography if anatomy in doubt. Convert to open if operation is not progressing or Cholangiogram does not define anatomy clearly.

| Strasberg Classification of Biliary Injury and Stricture | |
|---|---|
| Class A | Injury to small ducts in continuity with the biliary system, with cystic duct leak |
| Class B | Injury to sectoral duct with consequent obstruction |
| Class C | Injury to sectoral duct with consequent bile leak |
| Class D | Lateral injury to extrahepatic ducts |
| Class$E_1$ | Stricture >2 cm distal to bifurcation |
| Class$E_2$ | Stricture <2 cm distal to bifurcation |
| Class$E_3$ | Stricture at bifurcation |
| Class$E_4$ | Stricture involving right and left bile ducts; ducts are not in continuity |
| Class$E_5$ | Complete occlusion of all bile ducts |

**STRASBERG CLASSIFICATION**

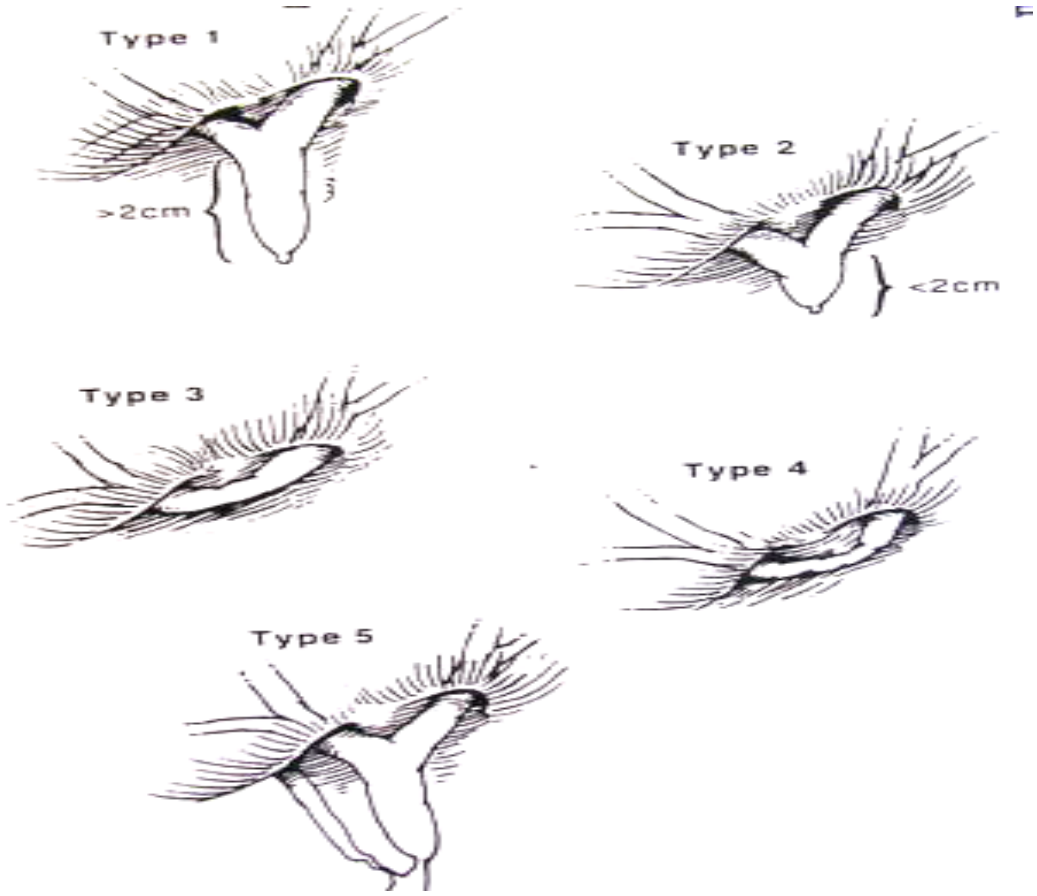
**STEWART WAY CLASSIFICATION**



## STEWART-WAY'S CLASSIFICATION OF LAPAROSCOPIC BILE DUCT INJURIES

| Class | Criteria |
|---|---|
| I | CBD mistaken for cystic duct, but recognized<br>Cholangiogram incision in cystic duct extend |
| II | Bleeding, poor visibility<br>Multiple clips placed on CBD/CHD |
| III | CBD mistaken for cystic duct, not recognized<br>CBD, CHD, or right or left hepatic ducts transected and/orresected |
| IV | Right hepatic duct (or right sectorial duct) mistaken for cystic duct<br>Right hepatic artery mistaken for cystic artery<br>Right hepatic duct (or right sectorial duct) and right hepatic artery transected |

# BISMUTHCLASSIFICATION



BISMUTH classifies major injuries based on the level of obstruction of the biliary tree.

Type

1. Low CHD stricture, with a length of the common hepaticduct stump of >2 cm
2. Proximal CHD stricture-hepatic duct stump <2 cm
3. Hilar stricture, no residual CHD, but the hepatic ductal confluence is preserved
4. Hilar stricture, with involvement of confluence and loss of communication between right and left hepatic duct
5. Involvement of aberrant right sectorial hepatic duct alone or with concomitant stricture of the CHD

A drawback of the Bismuth classification is that patients with limited strictures, isolated right hepatic duct strictures, or cystic duct leaks cannot be classified. The Strasberg classification is able to classify all types of injury and is used extensively in describing bile duct injuries associated with laparoscopic cholecystectomy

There are few absolute contraindications to laparoscopic cholecystectomy. Certainly, no patient who poses an unacceptable risk for open cholecystectomy should be considered for laparoscopic cholecystectomy, because it is always possible that conversion will become

necessary. Of the relative contraindications, surgical inexperience is the most important Neither ascites nor hernia is a contraindication to laparoscopic cholecystectomy Patients with stomas may also undergo laparoscopic cholecystectomy,

Questions have been raised about whether laparoscopic cholecystectomy should be performed in pregnant patients; it has been argued that the increased intra-abdominal pressure may pose a risk to the fetus. Because of the enlarged uterus, open insertion of the initial trocar is mandatory, and the positioning of other trocars may have to be modified according to the position of the uterus. Inflation pressures should be kept as low as possible, and prophylaxis of deep vein thrombosis (DVT) is recommended. Despite these potential problems, safe performance of laparoscopic cholecystectomy and other laparoscopic procedures in pregnant patients is increasingly being described in the literature. If cholecystectomy is necessary before delivery, the second trimester is the best time for it. Patients in whom preoperative imaging gives rise to a strong suspicion of gallbladder cancer should probably undergo open surgical management.

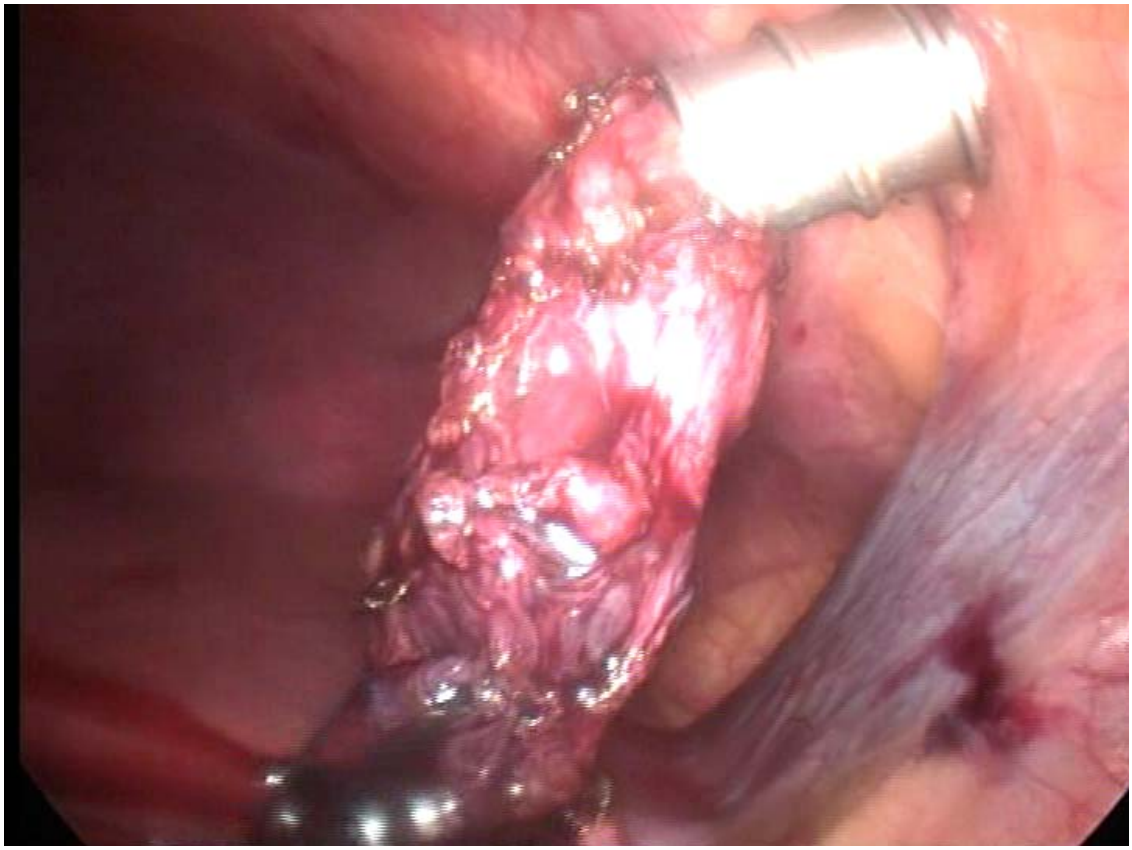
**Postoperative**

If a patient (1) complains of a great deal of abdominal pain necessitating systemic narcotics, (2) has a high or prolonged fever, (3) experiences ileus, or (4) becomes jaundiced, an intra-abdominal complication may have occurred.

**Fever**

Postoperative fever is a common complication of laparoscopic cholecystectomy. As noted, it may be indicative of a complication such as a bile collection or bile leakage. Other common reasons for postoperative fever (e.g., atelectasis) should also be considered

# GALL BLADDER RETREIVAL



## COMPLICATION RATE IN CHOLECYSTECTOMY

| S.NO | STUDY | COMPLICATION RATE |
|---|---|---|
| 1 | Surgical Department,austria | 1.9% |
| 2 | multivariate analysis of 7 large group studies | 2.6% |
| 3 | Department of Surgery, Washington University | 4% |
| 4 | The Southern Surgeons Club. A prospective analysis | 5% |

# METHOD OF
# LAPAROSCOPIC HERNIA REPAIR

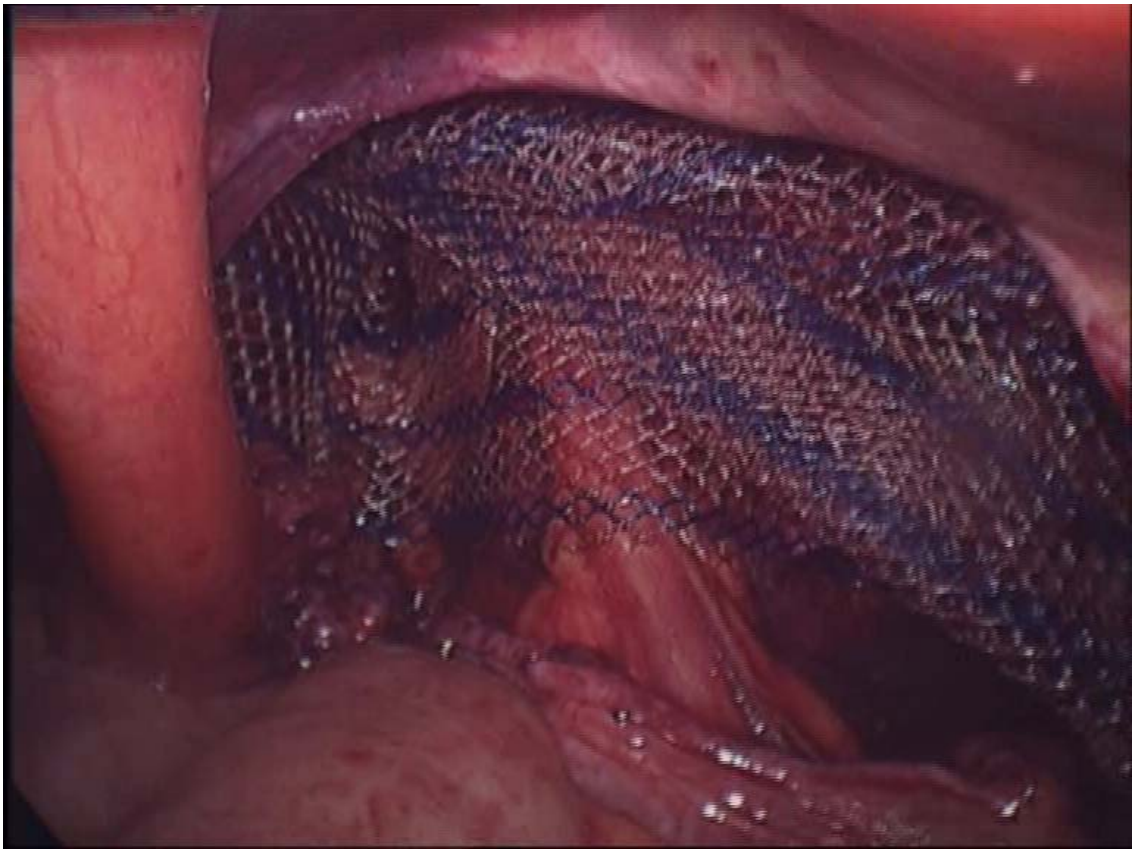
TYPES OF LAPAROSCOPIC HERNIA REPAIR:

*Totally Extraperitoneal Approach*

*Trans abdominal pre peritoneal repair*

Trans abdominal pre peritoneal repair was done in our setup for a few cases in the stipulated period. After preparation and positioning, with pneumoperitoneum achieved trocars are placed. Four key anatomic landmarks namely the spermatic vessels, the obliterated umbilical artery (medial umbilical ligament), the inferior epigastric vessels (lateral umbilical ligament), and the external iliac vessels are identified. Followed by creation of peritoneal flap and dissection of hernial sac. This is succeeded by reidentification and exposure of landmarks, placement of mesh and anchoring it with closure of peritoneum. Although there is a large body of literature on laparoscopic inguinal hernia repair including a variety of randomized, controlled trials the benefits of the laparoscopic approach have not yet been clearly defined or widely accepted. Given the low morbidity and relatively short recovery already associated with the conventional operation, demonstration of any significant differences between the open mesh and laparoscopic techniques requires large study samples.

**TAPP**



## 1. TRIANGLE OF DOOM:

The triangle of doom is defined be vas deferens medially, spermatic vessels laterally and external iliac vessels inferiorly. This triangle contains external iliac artery and vessels, the deep circumflex iliac vein, the genital branch of genitofemoral nerve and hidden by fascia the femoral nerve. Staple should not be applied in this triangle otherwise; chances of mortality are there if these great vessels are injured.

## 2. TRIANGLE OF PAIN:

Triangle of pain is defined as spermatic vessel medially, the iliopubic tract laterally and inferiorly the inferior edge of skin incision. This triangle contains lateral femoral cutaneous nerve and anterior femoral cutaneous nerve of thigh. The staple in this area should be less because nerve entrapment can cause neuralgia.

## 3. CIRCLE OF DEATH:

This is also called as corona mortis and refers to vascular ring form by the anastomosis of an aberrant artery with the normal obturator artery arising from a branch of the internal iliac artery. At the time of laparoscopic hernia this vessel is torn both end of vessel can bleed profusely, because both arise from a major artery. The surgeon should remember these anatomic landmarks

and the point of mesh fixation should be selected superiorly, laterally and medially.

## DISADVANTAGES AND COMPLICATIONS

Need for general anesthesia

Lower cost-effectiveness

Complications of access to peritoneal cavity

Complications of dissection

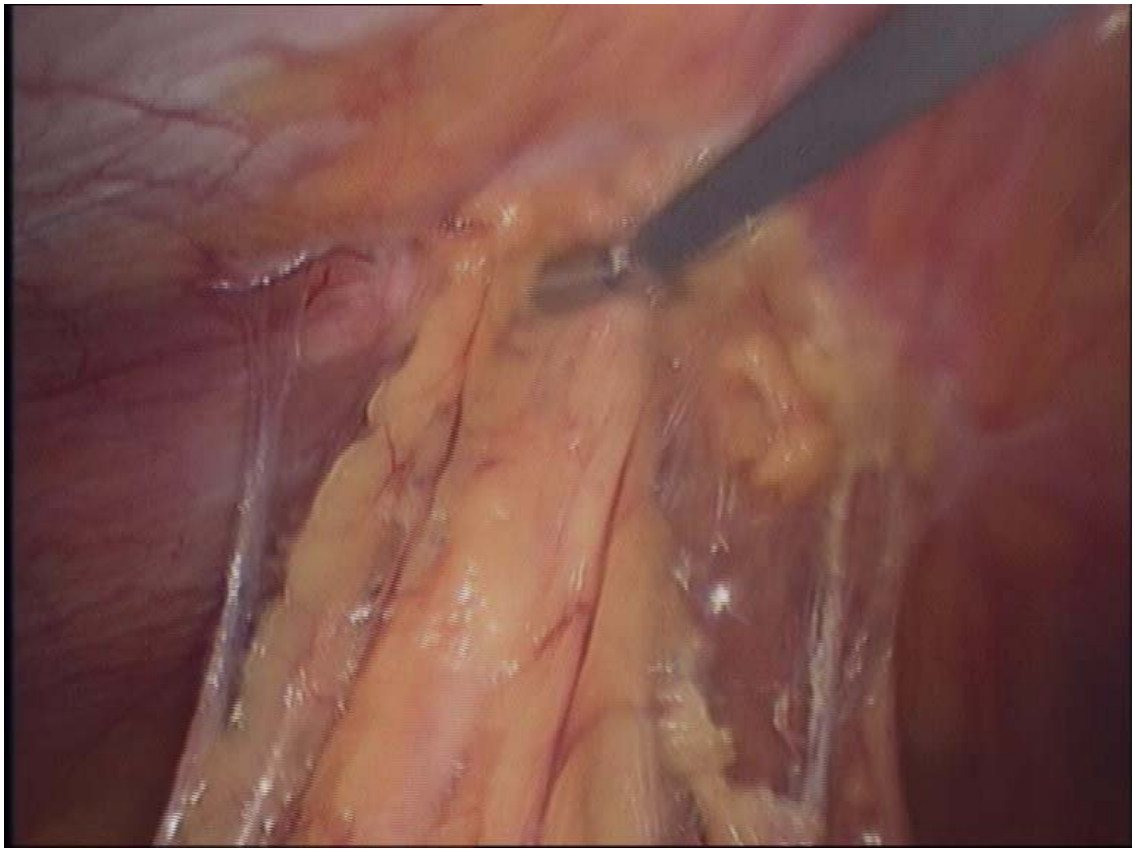
Complications related to mesh

Urinary complications

Vas deferens and testicular complications

Postoperative groin and thigh pain

# ADHESOLYSIS



## INSTRUMENTS

1. Distension media
2. Pneumoinsufflator
3. Insufflating needle-veress needle
4. Primary trocar and cannula
5. Laparoscopes
6. Light sources and cables
7. Video systems

## ANCILLARY INSTRUMENTS

1. Forceps
2. Scissors
3. Electrosurgical instruments
4. Laser
5. Sutures and ligatures
6. Clips and staples
7. Flushing and suction instruments
8. Needles

# *MATERIALS AND METHODS*

# MATERIALS AND METHODS

The prospective study was done in Govt Royapettah Hospital- Kilpauk Medical College, over a period of 28 months from June 2007 to October 2009.

During this study a total of 134 patients were categorized and assigned to various procedure groups. The patients were assigned to a surgical procedure based on the symptoms, clinical features, diagnostic criteria and investigations.

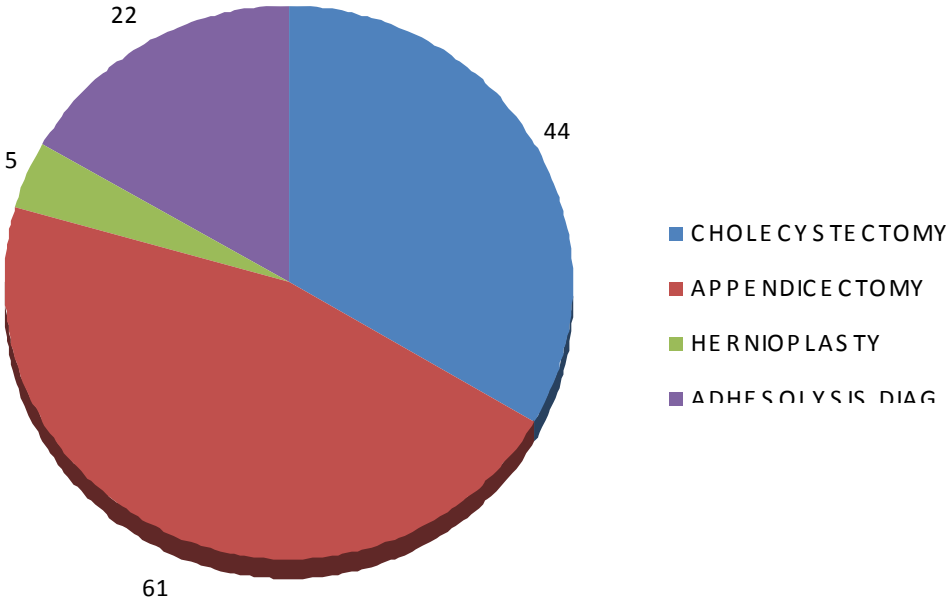
**Inclusion criteria:**

All patients who presented with clinical features and imaging features suggestive of chronic abdominal pathology and were planned for elective open surgery.

**Exclusion criteria**:

All patients with acute abdominal complaints due to the underlying pathology were excluded. Patients with uncontrolled hypertension, diabetes and known cardiac complications were not included. Patients apprehensive about the technique, and patients who were considered to be of the poor follow up group were excluded. Patients who were not fit for general anaesthesia due to any other cause were also excluded in the study.

# LAPAROSCOPIC SURGERIES



Total no of laparoscopic

| | | |
|---|---|---|
| Appendicectomy | : | 61 |
| Cholecystectomy | : | 44 |
| Hernioplasty | : | 5 |
| Diagnostic laparoscopy | : | 10 |
| Adhesolysis | : | 12 |

Age group of the patient : 12 to 65 yrs

Male : female : 55 : 79

RESULTS

No. of conversions to laparotomy : 3

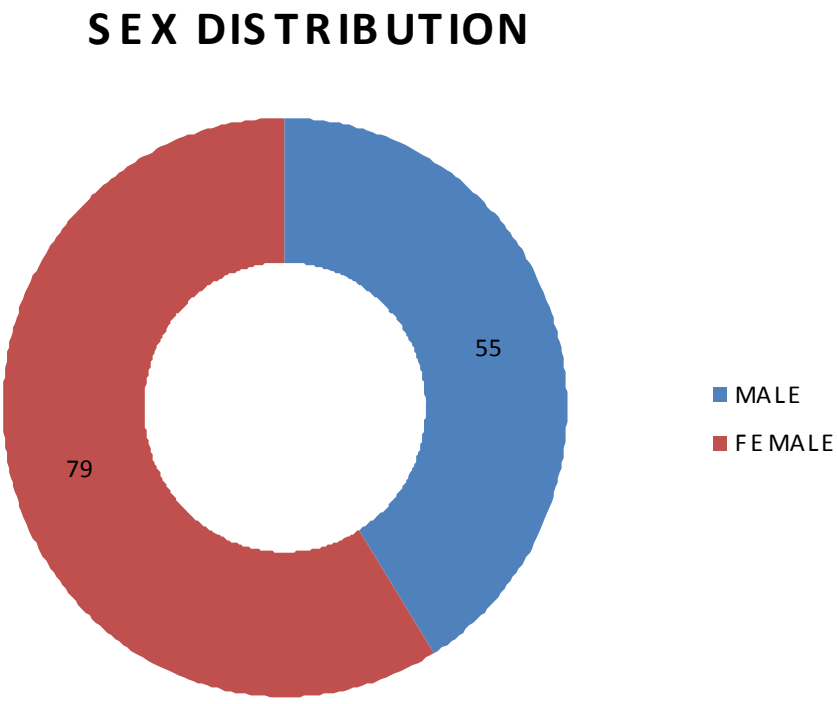
Patients with co morbidity : 10

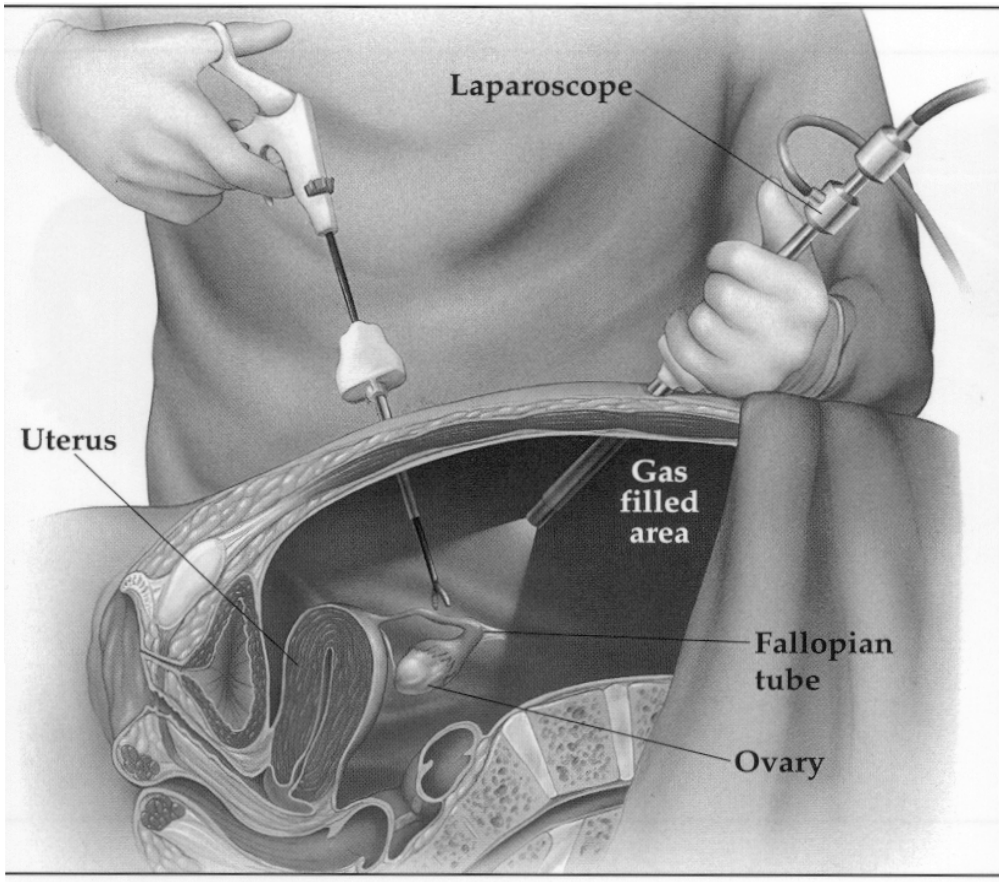
No. of cases of complications :

| | | |
|---|---|---|
| Intraoperative | : | 7 |
| Postoperative | : | 9 |

No. of patients cured without

Complications : 118


SEX DISTRIBUTION
55
79
MALE
FEMALE




Laparoscopic Procedure

In our study Diagnostic laparoscopy was more or less restricted to staging laparoscopy as around 50 percent of the cases were malignant disease. Staging laparoscopy allowed greater precision in identifying those for whom resection would be helpful, with less morbidity than open exploration.

The other major use was found in evaluation of chronic abdominal pain, of which four cases turned out to be abdominal tuberculosis. Biopsies were taken intra operatively and subsequent anti tuberculosis treatment was given.

# CONVERSION RATES

## CONVERSION IN LAPAROSCOPIC CHOLECYSTECTOMY

| S.NO | STUDY | CONVERSION RATE |
|---|---|---|
| 1 | KFH-AI-BAHA | 1% |
| 2 | WHERRY 1994 | 8.08% |
| 3 | RICHARDSON 1996 | 13.9% |
| 4 | AL HAIDI 1998 | 2.7% |
| 5 | KAMAL 2001 | 6.28% |
| 6 | KAUSHIK 2002 | 7.06% |
| 7 | Jammu 2007 | 11.93% |

## CONVERSION IN LAPAROSCOPIC APPENDICECTOMY

| S.NO | STUDY | CONVERSION RATE |
|---|---|---|
| 1 | SAGES | 0-2.7% |
| 2 | Clinic of Surgery , Germany | 4.5% |
| 3 | SALTS | 4.8% |
| 4 | Kluiber | 4.3% |

# *COMPLICATION CASES*

***NO SURGEON IS IMMUNE AND NO CASE SHOULD BE CONSIDERED ROUTINE***

COMPLICATION CASES

I. INTRAOPERATIVE BLEED:

Two cases of intraoperative bleeding were encountered during the study period in our setup.

The first case was a male patient with calculous cholecystitis, planned for laparoscopic cholecystectomy.

Complication : right hepatic artery injury

This case of cholecystitis was complicated by dense inflammatory adhesions, which on dissection led to inadvertent right hepatic artery injury with profuse bleeding. The bleeding point was identified but due to adhesions the procedure was converted to laparotomy for proper ligation of the bleeding artery.

The second case was a female with calculous cholecystitis evaluated, planned and posted for laparoscopic cholecystectomy.

Complication : cystic artery bleed

The patient was an obese female, a case of cholecystitis with repeated attacks of biliary colic, with normal CBD was planned for laparoscopic cholecystectomy.

The cystic duct was dissected of the Calot's triangle. On further dissection, sudden and pulsatile bleeding was noted in the Calot's triangle. With continuous suction irrigation the site of bleed could not be localized precisely. The procedure was immediately converted into open and the cystic artery identified and ligated. Procedure was completed.

**DISCUSSION**

Inflammatory adhesions due to acute cholecystitis or severe pancreatitis can hinder the exposure. Careful and meticulous dissection with correct identification of the cystic artery and clipping can prevent this complication. Help of additional ports or retrograde technique must be sought in such cases.

**TROCAR ASSOCIATED INJURY:**

We had one case of trocar associated injury, a male patient of age 13 years with Subacute appendicitis prepared for laparoscopic appendicectomy

Complication : trocar associated vessel injury

One of the earliest in our series of laparoscopic surgery was a subacute appendicitis, for which laparoscopic appendicectomy was completed successfully. The patient was shifted to the postoperative ward. With ongoing time the patient developed hypotension. On monitoring the patient was restless the pulse was feeble, the patient was tachypnoeic. Per abdominal examination revealed guarding and rigidity with severe tenderness.

The patient was immediately shifted to the operating room and laparotomy done. Massive intra peritoneal hematoma was seen. Bleeding was identified to be from the deep inferior epigastric artery, which was ligated. The patient recovered well without any further complications.

DISCUSSION :

The site of the secondary ports of entry must be selected carefully and the insertion must always be made under visual control and transilluminating the abdominal wall.

EXTRACTION OF GALL BLADDER:

Two cases of difficulty in extraction of the gall bladder specimen were encountered. One was due to large stones in situ,, and the other case was of thickened wall. For both the cases the fascial incisions were enlarged and specimen extracted.

INTESTINAL OBSTRUCTION POST TAPP:

A case of intestinal obstruction was encountered in a patient in whom laparoscopic hernia repair was done 3 weeks back. It was identified to be due to postoperative adhesions between the bowel and the mesh kept due to displacement of the peritoneum over the mesh resulting in it getting exposed.

OTHER COMPLICATIONS ENCOUNTERED :

3 cases of surgical site infection in the umbilical port was seen in late post operative period. Appropriate antibiotics were administered and infection settled well.

Early in the learning period two cases, one each of laparoscopic appendicectomy and cholecystectomy took unduly long time for completion. This was attributed to the learning curve and early handling difficulties. Both the patients had uneventful postoperative periods.

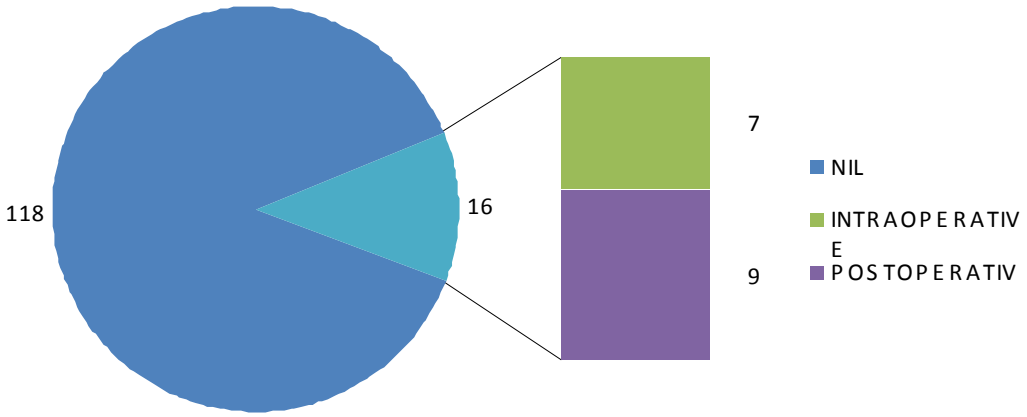
A case of abdominal pain 4weeks after cholecystectomy was diagnosed to be pancreatitis, but could not be further evaluated as the patient had absconded.

A case of laparoscopic adhesolysis for chronic abdominal pain with history of caesarean section, was unrelieved of the pain postoperatively. No further evaluation was done.

## COMPLICATIONS ENCOUNTERED IN OUR SETUP

| S.No | COMPLICATION | NO. OF PATIENTS | PERCENT | MANAGEMENT |
|---|---|---|---|---|
| 1 | Intraoperative Bleeding | 2 | 1.6% | Laparotomy |
| 2. | Dense adhesions | 1 | 0.8% | Laparotomy |
| 3. | Difficulty in delivering | 2 | 1.6% | Fascial incision extended |
| 4. | Post op bleeding | 1 | 0.8% | Laparotomy |
| 5. | Intestinal obstruction | 1 | 0.8% | Lap release |
| 6. | Postop pain | 2 | 1.6% | conservative |
| 7. | Wound sepsis | 3 | 2.5% | conservative |
| 8. | Prolonged duration | 2 | | |

## COMPLICATIONS



# *ANALYSIS*

# ANALYSIS

The potential complications of laparoscopic procedure include those related to laparoscopy and those related to specific procedure. The majority of these complications occur during the early learning phase for laparoscopy. They may also occur however, during procedures performed by surgeons who have considerable laparoscopic experience due to the disease process per se.

As new application for laparoscopy continue to emerge, it is important for the surgeon to be familiar with the possible complication associated with the various laparoscopy procedure. Very good infrastructure, adequate and proper training and skill are mandatory to minimize the complication and good surgical outcome. Only through an appreciation of the potential complications of a procedure and their overall incidence be reduced to minimum.

The following recommendations to minimize operative laparoscopy risks result from various literature reviews

1. Select appropriate patients for laparoscopy: weight greater than 100 kg, previous bowel obstruction or peritonitis,inflammatory bowel disease or more than two previous subumbilical vertical incisions may pose greater risks.
2. With all patients, discuss in simple language and document the risks, benefits, and alternatives to laparoscopy.
3. Consider conversion to laparotomy if difficulties are encountered, or abandon the procedure if no harm has been done and surgery is elective.
4. Report technical difficulty in the operative record and discuss complications post-operatively with the patient.
5. Consult an appropriate colleague if a complication occurs.

It is an evidence-based fact that minimal access surgery is superior to conventional open surgery. Different techniques, technologies and evidence-based guidelines have been introduced to eliminate the risk associated with laparoscopic. Proper evaluation of the patient, supported by good surgical skills and reasonably good knowledge of the technology of the instruments remain to be the cornerstone for safe access and success in minimal access surgery .

# *CONCLUSION*

# CONCLUSION

`In this study the rate of complications observed were more within the various literary reviews published and accepted worldwide. The rate of conversion to laparotomy was 2.5% against a average ranging between 4-8%. Our series indicated an overwhelming patient satisfaction in particular reference to postoperative pain with a low incidence of <2%.

Complications related to carbon dioxide pneumoperitoneum and increased intra-abdominal pressure did not really occur. In our series, the morbitity, were low and acceptable. The reported major complications raised the morbitity to 1.1%; they prolonged hospital stay, but without any further unwilling consequences.

As in all aspects of medicine, laparoscopic surgery requires experience on the part of the surgeon in order to afford patients the best possible outcome. The anatomy visible through a laparoscope differs in perspective from that presented in the open case, basic techniques such as suturing have to be relearned, and there is a decrease in tactile sense as an instrument is interposed between fingertip and tissue. Several surgeons have defined a learning curve for laparoscopic procedures after which the rate of complications plateau and most series note a decrease in the time necessary to complete a procedure from the first cases to the last. Adequate instruction and

super-vision would seem prudent as a surgeon ascends the learning curve. Ultimately, complications can be minimized but never avoided. Expeditious diagnosis and appropriate management of complications are requisite of all surgeons.

The conclusion drawn from this study is that laparoscopic surgery is a safe procedure with low morbidity rate. Complications can be minimized by maintaining a low threshold for conversion. Conversion is never a failure, it is a mark of PRUDENCE.

# *PROFORMA*

# PROFORMA

Name :

Age/sex :

Ip no. :

Ward :

Date of admission :

Date of surgery :

Date of discharge :

Main complaints :

Co morbid conditions : DM/HT/BA/CAD/PT

General examination :

Built, nourishment, hydration,

Pallor, icterus, pedal edema

Clinical examination :

P/A

CVS/RS

INVESTIGATIONS :

Biochemical

Sugar, Urea ,Creatinine

COMPLETE HEMOGRAM: Hb, TC, DC , BT, CT

ESR :

LFT: Serum bilirubin- Total Serum proteins - Total

Direct Albumin

Indirect Globulin

**IMAGING STUDIES**:

| | |
|---|---|
| X RAY ABDOMEN | |
| USG ABDOMEN | |
| UGI SCOPY | |

Diagnosis :

Procedure :

Findings :

Intra op complications :

Outcome of procedure :

Post op complications :

Management :

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# BIBLIOGRAPHY


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# *MASTER CHART*

# MASTER CHART

| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | MOORTHY | 30/M | 870602 | C | 25.5.07 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 2 | SAKUNTALA | 40/F | 871347 | F | 14.6.07 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 3 | KALAIYARASI | 25/F | 876310 | F | 23.7.07 | NIL | CHRONICABDOMINAL PAIN | DIAGNOSTIC LAPAROSCOPY | NIL |
| 4 | SAKUNTALA | 51/F | 881154 | F | 12.9.07 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | Prolonged Proedure |
| 5 | BALAKRISHNAN | 52/M | 882064 | C | 19.9.07 | diabetic | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 6 | PUSPHA | 23/F | 882235 | F | 8.10.07 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 7 | MURUGESAN | 56/M | 882079 | C | 5.12.07 | NIL | ? TUBERCULOSIS ABDOMEN | DIAGNOSTIC LAPAROSCOPY | NIL |
| 8 | SUBRAMANI | 60/M | 886473 | C | 5.12.07 | NIL | ADHESIVE COLIC | ADHESOLYSIS | NIL |

| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 9 | KRISHNAMOORTHY | 53/M | 881367 | C | 10.12.07 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 10 | KAVITHA | 23/F | 887826 | F | 20.12.07 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATION |
| 11 | ROSY | 29/F | 888616 | F | 31.12.07 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APENDICECTOMY | NIL |
| 12 | RAVINDRAN | 13/M | 889092 | C | 9.01.08 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPUIC APENDICECTOMY | Port site bleeding |
| 13 | YASODHA | 42/F | 889775 | F | 28.01.08 | NIL | ADHESIVE OLIC | LAPAROSCOPIC ADHESOLYSIS | NIL |
| 14 | MOHINI | 40/F | 887969 | F | 30.01.08 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 15 | AYESHA | 22/F | 890775 | F | 6.2.08 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APENDICECTOMY | NIL |
| 16 | KARTHIK | 15/M | 891488 | C | 13.2.08 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APENDICECTOMY | NIL |

| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 17 | PRASAD | 16/M | 910998 | C | 10.9.08 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APENDICECTOMY | NIL |
| 18 | BABY | 60/F | 914357 | F | 22.9.08 | diabetic | CHRONIC ABDOMINAL PAIN | LAPAROSCOPIC ADHESOLYSIS | wound infecton |
| 19 | REBECCA | 20/F | 906112 | F | 21.10.08 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APENDICECTOMY | NIL |
| 20 | MARI | 46/M | 920798 | C | 5.11.08 | NIL | CA STOMACH | DIAGNOSTIC LAPAROSCOPY | NIL |
| 21 | RAVI | 25/M | 910895 | C | 8.11.08 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 22 | SELVARAJ | 28/M | 912200 | C | 20.11.08 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 23 | MANJLA | 19/F | 912793 | F | 2.12.8 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 24 | HEMAVATHY | 40/F | 914334 | F | 22.12.08 | HT | ADHESIVE COLIC | LAPAROSCOPIC ADHESOLYSIS | NIL |
| 25 | SUNDAR | 23/M | 914271 | C | 30.12.08 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |

| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 26 | ANJALAI | 40/F | 914734 | F | 5.1.09 | NIL | CA OVARY STAGE III | STAGING LAPAROTOMY | NIL |
| 27 | SARANYA | 13/F | 915471 | F | 12.1.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 28 | CHANDRASEKAR | 23/M | 916093 | C | 28.1.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 29 | BALAPOORAN | 19/F | 916729 | F | 29.1.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 30 | TAMILARASI | 21/F | 917102 | F | 30.1.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | post op pain abdomen |
| 31 | DEVI | 19/F | 916706 | F | 5.2.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 32 | ELUMALAI | 32/M | 917484 | C | 7.2.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 33 | AYESHA | 35/F | 917329 | F | 9.2.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 34 | PRABHU | 26/M | 917790 | C | 13.2.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |

| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 35 | VENKATESAN | 34/M | 917665 | C | 14.2.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECOMY | NIL |
| 36 | MANOHARI | 44/F | 918224 | F | 23.2.09 | diabetic | ADHESIVE COLIC | LAPAROSCOPIC ADHESOLYSIS | NIL |
| 37 | JAMUNA | 48/F | 918215 | F | 25.2.09 | diabetic | ADHESIVE COLIC | LAPAROSCOPIC ADHESOLYSIS | NIL |
| 38 | SAIRABANU | 41/F | 917617 | F | 26.2.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 39 | VIMALA | 42/F | 918229 | F | 26.2.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECOMY | NIL |
| 40 | KALA | 32/F | 976976 | F | 2.3.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 41 | KHADARBEE | 33/F | 919026 | F | 2.3.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 42 | ANNAPOORANI | 38/F | 917440 | F | 4.3.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 43 | GLORY | 28/F | 919013 | F | 7.3.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |

| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 44 | VALLI | 36/F | 918957 | F | 9.3.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 45 | BAGYALAKSHMI | 42/F | 918827 | F | 11.3.09 | NIL | ADHESIVE COLIC | LAPAROSCOPIC ADHESOLYSIS | Persistent pain |
| 46 | BOOPALAN | 16/M | 919341 | C | 14.3.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDCECTOMY | NIL |
| 47 | SEBASIN | 54/M | 919603 | C | 16.3.09 | NIL | ADHESIVE COLIC | LAPAROSCOPIC ADHESOLYSIS | NIL |
| 48 | LALITHA | 48/M | 918143 | F | 17.3.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 49 | AMBIGA | 37/F | 919769 | F | 18.3.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 50 | RAJASEKAR | 33/M | 918143 | C | 18.3.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | post op pain abdomen |
| 51 | SASIKALA | 17/F | 920374 | F | 24.3.09 | NIL | SUBACTE APPENDICITS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 52 | CHARI | 45/F | 920076 | C | 25.3.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |

| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 53 | FATHIMA | 30/F | 920257 | F | 26.3.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 54 | NAGAMMAL | 52/F | 930010 | F | 1.4.09 | HT | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 55 | NEELAVATHY | 28/F | 920548 | F | 6.4.09 | NIL | SUBACTE APPENDICITS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 56 | JEYANTHI | 45/F | 920300 | F | 6.4.09 | NIL | ADHESIVE COLIC | LAPAROSCOPIC ADHESOLYSIS | NIL |
| 57 | KULANJI | 45/F | 920918 | F | 9.4.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 58 | SATHISH | 18/M | 920994 | C | 9.4.09 | NIL | SUBACTE APPENDICITS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 59 | MANDODARI | 38/F | 922092 | F | 22.4.09 | NIL | SUBACTE APPENDICITS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 60 | SEENU | 20/M | 922184 | C | 25.4.09 | NIL | SUBACTE APPENDICITS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 61 | LATHA | 28/F | 922315 | F | 27.4.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |

| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 62 | ELUMALAI | 30/M | 921795 | C | 27.409 | NIL | KOCH'S ABDOMEN | DIAGNOSTIC LAPAROSCOPY | NIL |
| 63 | DHANALAKSMI | 47/F | 922508 | F | 29.4.09 | NIL | CALCLOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 64 | GOVINDAMMAL | 31/F | 922245 | F | 30.4.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 65 | SELVI | 40/F | 922959 | F | 2.5.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 66 | PRAVEEN | 15/M | 927308 | C | 2.5.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 67 | VIDHYALAKSHMI | 3/F | 923223 | F | 12.5.09 | NIL | CALCLOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 68 | CHAKRAVARTHY | 26/M | 923241 | C | 20.5.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 69 | VIMALA | 59/F | 923449 | F | 22.5.09 | diabetic | CALCLOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | WOUND INFECTION |
| 70 | RAJAM | 55/F | 924576 | F | 27.5.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |

| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 71 | SHOBANA | 38/F | 924644 | F | 30.5.09 | NIL | CALCLOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 72 | SUMATHI | 28/F | 9252421 | F | 2.6.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 73 | JEYAPRAKASH | 17/M | 925185 | C | 6.6.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 74 | DHANALAKSHMI | 40/F | 924792 | F | 8.6.09 | NIL | CA OVARY | DIAGNOSTIC LAPAROSCOPY | NIL |
| 75 | CHANDRAN | 42/M | 92591 | C | 10.6.09 | NIL | CALCLOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | difficult delivery |
| 76 | BAKTHAVACHALAM | 59/M | 925824 | C | 13.6.09 | HT | CA HEAD OF PANCREAS | DIAGNOSTIC LAPAROSCOPY | NIL |
| 77 | KARPAGAM | 43F | 926181 | F | 15.6.09 | NIL | CALCLOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 78 | SELVAM | 30/M | 926175 | C | 19.6.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 79 | PARIMALA | 30/F | 926342 | F | 20.6.09 | NIL | CALCLOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |

| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 80 | SARASWATHY | 42/F | 926345 | F | 22.6.09 | NIL | ADHESIVE COLIC | LAPAROSCOPIC ADHESOLYSIS | NIL |
| 81 | VISWANATHAN | 15/M | 927206 | C | 27.6.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPC APPENDICECTOMY | NIL |
| 82 | LAKSHMI | 45/F | 92708 | F | 29.6.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPC APPENDICECTOMY | NIL |
| 83 | JANAKI | 62/F | 927191 | F | 3.7.09 | diabetic | CALCULOUS CHOLECYSTITIS | LAPAROSCOPC CHOLECYSTECTOMY | prolonged procedure |
| 84 | MEENAKSHI | 45/F | 927471 | F | 6.7.0 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 85 | MAHARAJAA | 43/M | 926867 | C | 7.7.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 86 | CHANDRA | 55/F | 927910 | F | 8.7.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 87 | BABY | 38/F | 928120 | F | 1.7.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 88 | SARASU | 38/F | 928199 | F | 14.7.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 89 | DILLIBABU | 24/M | 928411 | C | 17.7.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |

| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 90 | SUJATHA | 25/F | 92395 | F | 17.7.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 91 | JAISHANKAR | 40/M | 928340 | C | 20.7.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 92 | MUNIAN | 26/M | 928412 | C | 21.7.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 93 | NARAYANAN | 55/M | 928634 | C | 25.7.09 | NIL | Rt.INGUINAL HERNIA | LAPAROSCOPIC HERNIA REPAIR | NIL |
| 94 | NATARAJAN | 48/M | 928635 | C | 25.7.09 | NIL | Lt.INGUINAL HERNIA | LAPAROSCOPIC HERNIA REPAIR | NIL |
| 95 | SAKUNTHALA | 55/F | 928349 | F | 29.7.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 96 | RAJA | 19/M | 929021 | C | 30.7.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 97 | KUMAR | 40/M | 929445 | C | 1.8.09 | NIL | Rt.INGUINAL HERNIA | LAPAROSCOPIC HERNIA REPAIR | intestinal obstruction |
| 98 | SELVAN | 40/M | 929320 | C | 1.8.09 | NIL | BIL.INGUINAL HERNIA | LAPAROSCOPIC HERNIA REPAIR | NIL |
| 99 | MADHESHKUMAR | 29/M | 929493 | C | 3.8.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | difficult delivery |
| 100 | DIVYAPRIYA | 12/F | 929273 | F | 5.8.09 | NIL | ADHESVE COLIC | LAPAROSCOPIC ADHESOLYSIS | NIL |

| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 101 | SELVARANI | 27/F | 929198 | F | 5.8.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 102 | JEYRESHA | 25/F | 929801 | F | 6.8.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 103 | GOVINDARAJ | 19/M | 929942 | C | 8.8.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 104 | KARTHIKEYAN | 20/M | 930002 | C | 17.8.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 105 | SRINIVASAN | 32/M | 929783 | C | 18.8.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 106 | RAJKUMAR | 25/M | 929684 | C | 18.8.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 107 | KANNIYAMMAL | 62/F | 930264 | F | 19.8.09 | diabetic | Lt. LOBE LIVER SIMPLE CYST | LAPAROSCOPIC DEROOFING | wound infection |
| 108 | VELLAIYAN | 23/M | 93049 | C | 20.8.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 109 | LAKSHMI | 65/F | 929849 | F | 2.8.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | Abdominal pain |
| 110 | BALAMURUGAN | 14 | 931420 | C | 29.8.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 111 | SUNDARI | 22/F | 931420 | F | 29.8.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPEDICECTOMY | NIL |

| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 112 | KRISHNAN | 62/M | 931440 | C | 2.9.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |
| 113 | ANJALAI | 37/F | 930219 | F | 2.9.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTCTOMY | NIL |
| 114 | SATHISH | 15/M | 932474 | C | 11.9.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 115 | ABIRAMI | 26/F | 932479 | F | 14.9.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 116 | KAMARAJ | 42/M | 932122 | C | 16.9.09 | NIL | RT.INGUINAL HERNIA | LAPAROSCOPIC HERNIOPLASTY | NIL |
| 117 | PITCHANDI | 47/M | 932815 | C | 25.9.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTCTOMY | NIL |
| 118 | RADHA | 50/F | 933872 | F | 7.10.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTCTOMY | NIL |
| 119 | KAMALA | 65/F | 933710 | F | 7.10.09 | NIL | Ca STOMACH | DIAGNOSTIC LAPAROSCOPY | NIL |
| 120 | ANUSHYA | 60/F | 934743 | F | 12.10.09 | NIL | Ca STOMACH | DIAGNOSTIC LAPAROSCOPY | NIL |
| 121 | VADIVA | 35/F | 934746 | F | 12.10.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDIECTOMY | NIL |
| 122 | HASINA BEGUM | 43/F | 934666 | F | 14.10.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOMY | NIL |

| S.NO | NAME | AGE/SEX | IP.NO | WARD | D.O.S | COMORBID | DIAGNOSIS | PROCEDURE | COMPLICATIONS |
|---|---|---|---|---|---|---|---|---|---|
| 123 | MADHU | 55/M | 934502 | C | 14.10.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOM | NIL |
| 124 | GOVINDAMMAL | 50/F | 933726 | F | 14.10.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDIECTOMY | NIL |
| 125 | GOPALAKRISHNAN | 21/M | 935210 | C | 20.10.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDIECTOMY | NIL |
| 126 | GIRIJA | 26/F | 935279 | F | 23.10.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOM | CYSTIC ARTERY |
| 127 | DEVANMMAL | 40/F | 934201 | F | 26.10.09 | NIL | Ca OVARY | DIAGNOSTIC LAPAROSCOPY | NIL |
| 128 | VENKATESAN | 24/F | 935544 | C | 27.10.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDIECTOMY | NIL |
| 129 | MANIMEGALAI | 35/F | 935018 | F | 2.11.09 | NIL | CHRONIC ABDOMINAL | DIAGNOSTIC LAPAROSCOPY | NIL |
| 130 | NIRMALA | 25/F | 936041 | F | 3.11.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDIECTOMY | NIL |
| 131 | JOTHILAKSMI | 23/F | 936360 | F | 4.11.09 | NIL | CALCULOUS CHOLECYSTITIS | LAPAROSCOPIC CHOLECYSTECTOM Y | CONVERTED TO OPEN |
| 132 | KAMALA | 34/F | 930464 | F | 5.11.09 | NIL | ADHESIVE COLIC | ADHESOLYSIS | NIL |
| 133 | HARI | 16/M | 936490 | C | 6.11.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |
| 134 | SOMASEKAR | 2O/M | 936514 | C | 6.11.09 | NIL | SUBACUTE APPENDICITIS | LAPAROSCOPIC APPENDICECTOMY | NIL |